

AGRICULTURAL HISTORY

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THE AGRICULTURAL HISTORY SOCIETY

The Agricultural History Society
1959
ANNUAL BOOK AWARD

winner is

Dr. Clark C. Spence

Pennsylvania State University

for his manuscript

**"God Speed the Plow—the Coming of Steam Cultivation
to Great Britain"**

★ ★ ★

The manuscript will be published in 1959 by the
University of Illinois Press

★ ★ ★

Entries for the 1960 Award are now being accepted. Deadline for entries in the 1960 competition is November 1, 1959. Those interested in submitting manuscripts should write to C. Clyde Jones, Editor, Agricultural History, 214 David Kinley Hall, University of Illinois, Urbana, Illinois, for a copy of rules and for an application which must accompany all manuscripts.

AGRICULTURAL HISTORY

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AGRICULTURAL HISTORY

The Quarterly Journal of the Agricultural History Society

Agricultural History is designed as a medium for the publication of research and documents pertaining to the history of agriculture in all its phases and as a clearing-house for information of interest and value to workers in the field. Materials on the history of agriculture in all countries are included, and also materials on institutions, organizations, and sciences which have been factors in agricultural development. The Society is not responsible for the statements or opinions of contributors. Editorial communications and books for review should be sent to C. Clyde Jones, Editor, Room 214, David Kinley Hall, University of Illinois, Urbana, Illinois.

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The National Cowboy Hall of Fame

A. M. GIBSON

When the National Cowboy Hall of Fame was chartered in 1955, it marked the fruition of a lengthy one-man crusade. Chester A. Reynolds, a Kansas City manufacturing executive, worked nearly full-time for over a decade in promoting a memorial which would preserve the heritage of the West. A frequent visitor at cattlemen's association meetings and rodeos, Reynolds was reported to have hit upon the idea of a cowboy monument 11 years ago while visiting the Will Rogers Memorial in Claremore, Oklahoma.¹ Through the years, Reynolds traveled to various national shrines commemorating persons, groups, and movements. These included the Baseball Hall of Fame at Cooperstown, New York. At each stop, Reynolds studied the importance of location, methods of selecting honorees, and other significant points which would be applicable to his proposed National Cowboy Hall of Fame.

Reynolds died on December 14, 1958, at the age of 71.² Yet, he lived long enough to see his dream at least partially realized. By 1954, Reynolds had sold ranchmen, governors, and leading citizens of the West on the idea of a National Cowboy Hall of Fame, and in early 1955, a charter had been drafted and approved, and an organization created. And on August 5, 1957, the U. S. Congress declared the National Cowboy Hall of Fame a national monument.³ The Concurrent Resolution also endorsed the aims of the National Cowboy Hall of Fame which are to honor the range industry and those men and women who have made a significant contribution to the progress and tradition of the West as working cowboys, cattlemen, rodeo cowboys, pioneers, trailblazers, and others deemed worthy by the trustees.

According to its by-laws, the National Cowboy Hall of Fame has a membership constituency of 17 states: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. Two delegates are selected from each of the 17 member states. These comprise the board of trustees.

The incumbent governor of each state also serves on the board of trustees as an *ex officio* member. Original trustee terms were divided into two, four, and six year periods. Thereafter, board members are to be elected by the membership of the National Cowboy Hall of Fame for six year terms. The board of trustees serves as a managerial body for the organization, conducting official business, looking after shrine property, and approving nominations to the Hall. An executive committee consisting of a chairman, three vice-chairmen, secretary, and treasurer conduct business for the trustees when that body is not in session.⁴

Membership in the National Cowboy Hall of Fame consists of seven classes, the first five of which have voting privileges. These membership classes are based on the amount of money each member donates to the treasury of the Hall. The top category is Foundation Gift Membership, and is based on a donation of \$25,000 or more. There follow Special Gift Memberships at from \$5,000 to \$25,000; Sponsor Memberships at \$500 and up; Life Memberships for \$200; Active Memberships at \$100; Sustaining Memberships at \$50; Special Memberships at \$25; Associate Memberships for \$10; and persons under 19 may purchase Junior Memberships for \$1.⁵

Honorees may be nominated by historical societies, livestock and rodeo associations, and other groups and individuals from each of the 17 member states. Not more than ten names may be submitted each year by any one state. From the ten nominees, no more than two from each state will be voted on at any one meeting. Also, 16 additional nominations may be submitted as at-large candidates regardless of home state. Selection of at-large candidates is made by a

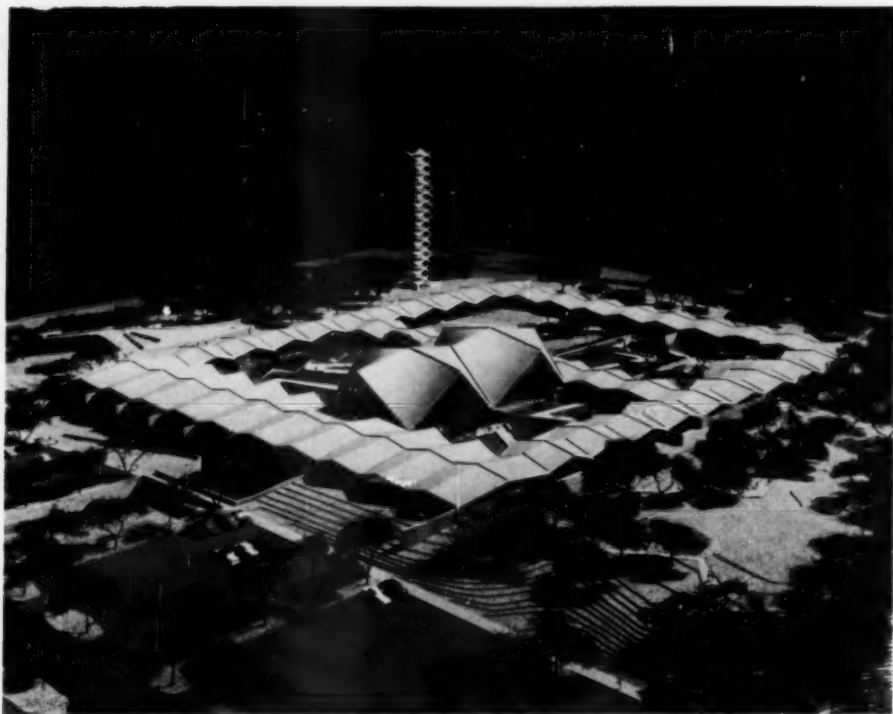
¹ Roy P. Stewart, "Cowboys on a Pedestal," Press Release dated October 15, 1955, National Cowboy Hall of Fame Files.

² *Daily Oklahoman*, December 15, 1958.

³ U. S. Congress, *Congressional Record*, May 16, 1957.

⁴ By-Laws of the National Cowboy Hall of Fame and Museum, National Cowboy Hall of Fame Files.

⁵ *Ibid.*, and Membership Promotion Brochure prepared by the Trustees.



Architects' model of National Cowboy Hall of Fame and Museum, Oklahoma City

committee of six writers and historians.⁶ A nominee must have three-fourths vote by the trustees to be admitted to the National Cowboy Hall of Fame. From the at-large nominations, National Cowboy Hall of Fame trustees select five at-large members each year.

Thus far, a total of 63 honorees have been selected. Prior to 1959, the at-large inductees were Will Rogers, Oklahoma; Jack McClure, New Mexico; Charles Goodnight, Texas; Theodore Roosevelt, New York and Dakota; Charles Russell, Montana; Edward F. Beal, California; Warren L. Blizzard, Oklahoma; William F. Cody, Nebraska; Dr. Charles F. Curtiss, Ames, Iowa; James J. Hill, Minnesota; Pete Knight, Crossfield, Alberta; Henry Miller, California; Tom Mix, Texas; Eugene Manlove Rhodes, New Mexico; Brigham Young, Utah; and Frank S. Boice, Arizona. The 1959 at-large selections are especially noteworthy in the development of the West: Sacajawea, the Shoshone woman who guided the Lewis and Clark expedition to the Pacific,

and the first woman as well as the first full-blood Indian to enter the Hall of Fame; Christopher "Kit" Carson, mountain man, guide, and scout; William MacLeod Raine, Western fiction writer of 80 novels with a sale of 19,000,000 copies; and Captain Richard King, Irish immigrant, founder of the world-famous King Ranch, and developer of the first new beef breed in America—the Santa Gertrudis.⁷

Honorees by states before 1959 have been: Arizona, Ramon Ahumado and George C. Ruffner; California, Henry C. Daulton and

⁶ The present At-Large Nominating Committee consists of Robert West Howard, Roving Editor for the American Meat Institute, Chairman; Homer Croy, Western novelist and biographer; Wayne Gard, Editorial Writer for the *Dallas News*, and writer on the West; Agnes Wright Spring, State Historian of Colorado; Don Russell, Chicago editor and Western researcher; and Marc Jaffee, Western America Editor of New American Library, New York City.

⁷ "Cowboy Hall of Fame Honorees," Press Releases dated April 1, 1955 and January 5, 1958, National Cowboy Hall of Fame; *Daily Oklahoman*, March 6, 1959.

Fred H. Bixby; Idaho, Frank R. Gooding and John Hailey; Kansas, Dan D. Casement and Calvin W. Floyd; Montana, Carsten C. Kohrs and Robert S. Ford; Nebraska, Edward Creighton and Frank J. North; Nevada, Daniel C. Wheeler and John Sparks; New Mexico, John S. Chisum and Victor Culberson; North Dakota, John W. Goodall and Wilse L. Richards; Oklahoma, Charles H. Tompkins and Otto C. Barby; South Dakota, G. E. Lemmon and James Philip; Texas, Stephen F. Austin and Oliver Loving; Utah, Anthony W. Ivins and Jacob Hamblin; Washington, Andrew J. Splawn and Benjamin E. Snipes; Wyoming, John B. Kendrick and Francis E. Warren. Thirteen regular nominees were selected from as many states in 1959: Charles Colcord, Oklahoma; William Flake, Arizona; W. W. Hollister, California; Charles "Buffalo" Jones, Kansas; Nelson Story Sr., Montana; John Bratt, Nebraska; Lucien B. Maxwell, New Mexico; Lewis R. Bradley, Nevada; Alex Currie, North Dakota; Ben C. Ash, South Dakota; Daniel Waggoner, Texas; Frank M. Rothrock, Washington; and Joseph M. Carey, Wyoming.⁸

Following the organization of the board of trustees and naming of honorees, there remained selection of a site for erection of the buildings to house the National Cowboy Hall of Fame, decision on architecture of the buildings, and raising of funds to complete the structure.

On site selection, there was considerable competition, and over 400 cities in the 17 state constituency were recommended. In the spring of 1955, the trustees met at Denver and narrowed the list to ten cities. A committee from the trustees then visited each of these and reduced the number of possible sites to three—Dodge City, Colorado Springs, and Oklahoma City. Thereupon, delegations consisting of not more than six persons from each of the three cities were invited to present their respective cases before a full meeting of the trustees at Denver on April 15, 1955. One hour was allotted to each for presentation. Members used maps, charts, and photographs to point up their respective advantages, and interest ran high. Dodge City boosters imported a band and troop of horsemen in Western attire, and staged a lively parade to

impress trustees on behalf of the Kansas cow town.⁹

The Oklahoma City delegation, consisting of Governor Raymond Gary, Roy J. Turner, himself a former governor and world famous Hereford breeder, and Glen Faris, Secretary of the Oklahoma City Chamber of Commerce, offered a \$150,000 site of 37 acres on the rim of Oklahoma City for erection of the National Cowboy Hall of Fame and Museum buildings. Besides this, the Oklahoma Delegation announced that the Sooner State had raised \$1,000,000 by popular subscription. With a building site and \$1,000,000 to work with towards actual construction, the majority of the trustees voted for Oklahoma City. Roy P. Stewart of the *Daily Oklahoman* noted that while other site backers generally accepted gracefully, a local but hostile aftermath to the Oklahoma City selection developed on the part of some Kansas backers who told newsmen that "Oklahoma oil men bought the site. . . . We were sold down the river." The defected group at first attempted to raise funds for a competitive "Cowboy Capital of the World Museum,"¹⁰ but at last reports the Kansans are concentrating on restoration of Dodge City's famous "Front Street."¹¹

The 37-acre hilltop site on the east edge of Oklahoma City is in a sense the "Gateway to the West," overlooking the Trans-America Expressway, "a four-lane thoroughfare over which flows year around traffic of U.S. Highways 66 and 77 from four compass points, and traffic from the heavily traveled Turner and Will Rogers Turnpikes."¹²

The site decided upon, the trustees turned to selecting the architectural motif. A nationwide contest was launched with four prizes: First, the architectural commission for the project; second, \$3,000; third, \$2,500; fourth, \$1,500. A jury of five, three of them architects, with two Cowboy Hall of Fame trus-

⁸ *Ibid.*

⁹ Roy P. Stewart, "Cowboys on a Pedestal," Press Release dated October 15, 1955, National Cowboy Hall of Fame Files.

¹⁰ *Ibid.* Out of 32 votes cast, the tabulation was for Oklahoma City, 20; Dodge City, 11; and Colorado Springs, one.

¹¹ Interview with Glen Faris, Secretary of the National Cowboy Hall of Fame, Oklahoma City, January 23, 1959.

¹² "National Cowboy Hall of Fame and Museum," Promotional Brochure, 3.

tees, selected from a field of 249 entries the work of Harold Begrow and Jack W. Brown, of Birmingham, Michigan.¹³ The winning model attracted considerable attention and some criticism until the designers supplied an interpretation for their work:

From our observations and a lot of research, we feel that we have grasped some of the spiritual feeling and understanding of the West. It was easy to see that the cowboy, as a symbol of an era, was a dynamic individual with great freedom of movement and almost self sufficient. His individuality and semi-vagabond spirit put him in a category similar to the gypsy of Europe—perhaps with a dash of the Robin Hood characterization of English folklore. Our great problem then, was to find a type of architecture that was indigenous to the cowboy and to the Western pioneer. . . . The most prevalent forms of architecture in the West were transplanted from Mexico. The cowboy lived close to the earth. The pioneer lived near his wagon, his half-dugout or his soddy. Both of them had some of the feeling in early days that is sensed in the song about "don't fence me in." One thing always important to both was water. With it they could improvise shelter or do without. So, taking those facts as basic elements for the Cowboy Hall of Fame and Museum, we envisioned a camp-like setting, composed of tent type structures surrounding garden pools.¹⁴

In February, 1959, the trustees selected Roy J. Turner, Oklahoma cattleman and former governor of the Sooner State, as Chairman of

the Building Committee. Turner announced that invitations would be issued to contractors to submit bids during the month of March, 1959.¹⁵ While the overall plans call for a \$5,000,000 structure, current bidding will involve the central building only, estimated to cost \$1,500,000. This amount is available at the present time. As money from fund raising drives in the 17 member state area is paid in, additions will be made.¹⁶

The trustees also named a screening committee to select applicants for curator of the Hall of Fame and Museum. The trustees noted that it was desirable to name the curator soon in order that his work can progress as the building is erected. F. J. Deering of Oklahoma City, Amon Carter Jr., Fort Worth, Jasper Ackerman, Colorado Springs, Roger Jessup, Glendale, and Bill Aeschbacher, Lincoln, comprise the curator committee.¹⁷

¹³ "Report on Final Architectural Competition," January 1, 1957, National Cowboy Hall of Fame Files.

¹⁴ *Daily Oklahoman*, March 23, 1958.

¹⁵ Contract for construction of the central building was let Friday, May 22, 1959, to Lippert Brothers Construction by the Cowboy Hall of Fame Building Committee. The \$1,000,000 contract includes construction of all major foundation work for the entire \$5,000,000 layout. This will facilitate erection of additions as new funds become available. *Ibid.*, May 23, 1959.

¹⁶ *Ibid.*, March 1, 1959.

¹⁷ *Ibid.*

TURKEYS TO KILL GRASSHOPPERS

I would advise your correspondent from Kentucky who is annoyed with grasshoppers, to keep on his premises a flock of turkeys. I was surprised a few years ago, at seeing large flocks of turkeys in the meadow of a neighboring farmer, an enterprising, close calculating man. He told me that they had been annoyed with grasshoppers, and that by keeping turkeys a few years, he got rid of them. I have since kept a flock on my farm, and think they more than pay their way, especially where a farm is infested with grasshoppers.

—From *The Country Gentleman* (1855)

A TWENTY-POUND EGG ?

Listen, ye who boast of the doings of nine pounds hens and twelve pounds roosters! The shell of an egg, laid by one of the gigantic birds of Madagascar, has been received in Paris, the shell of which *holds nearly ten quarts!* This is a fact; and though the rage for big chickens is decidedly on the wane, we would suggest that some enterprising breeder send to the great African Island and import some of these *hens*, or at least a few of the eggs! They would doubtless take all the premiums at our Poultry Shows; at least so long as size rather than form is the test of excellence.

—From *The Country Gentleman* (1855)

Experiments in American Steam Cultivation

CLARK C. SPENCE

In 1871 Horace Greeley "admirably dedicated" his latest book, *What I Know of Farming*, to

THE MAN OF OUR AGE, who shall make the first plow propelled by STEAM, or other mechanical power, whereby not less than TEN ACRES PER DAY shall be thoroughly pulverized to a DEPTH OF TWO FEET at a cost of not more than two dollars per day.

With perhaps only one qualification, Greeley doubted "that a single square mile of our country's surface has been plowed wholly by steam down to this hour."¹ Not long before, another writer-agriculturist had estimated that there were over 3,000 steam-driven plows in England and only five in the United States.²

Such comments only served to point up the fact that Americans had not, by the decade of the 1870's, succeeded in harnessing the steam giant for cultivation of the soil; that American agriculture was lagging behind transportation and the manufacturing industries; and—more galling to many a Yankee—that Brother Jonathan was steadily losing ground to British inventors and plowmen.

That is not to say that American ingenuity had not been wrestling for some time with the thorny problem of substituting steam for animal power in the furrow. Who made the first attempt is not clear. Perhaps it was Luke Johnson of Leominster,³ Massachusetts, who in 1816 patented a "machine for drawing a plow"; perhaps it was some other visionary whose name is not even in the Patent Office records. Suffice it to say that the attempts were made and that by the 1830's and 1840's steam plow experiments in the United States were attracting attention; by the fifties and sixties they were widespread.

As with much of technological advancement, steam plow experimentation was often a matter of stimulus and response. The stubborn sod of the rolling prairies presented a definite challenge as the American farm domain pushed out onto the wheat lands of the West and it seemed to many that the steam horse might well be broken and adapted to this new terrain. Nor were the early examples of British inventors lost on

this side of the water. American editors of the 1830's and 1840's were not slow to comment on European innovations, foreseeing, they believed, the day when "grass will be cut and hay made—lands be ploughed and reaped—grain be thrashed and cleaned, and then sent to the mill, and the market, by steam!"⁴

To be sure, there was also much scoffing and a good deal of skepticism,⁵ but when it became apparent by the mid-nineteenth century that reasonably successful machines were at work in Great Britain, well-informed Americans stepped up their pleas for greater progress in this country. The *New York Times*, for example, placed the steam plow race on a purely national basis:

What are American mechanics doing towards applying steam to the soil tilling? Here is a fine field for someone. Steam, and not animal muscles, is speedily to become the moving power before clod breakers, and the man who first successfully yokes the steam-chest to the plow will reap a rich harvest. Notwithstanding the present interest awakened abroad, we predict that that man now lives on this side of the Atlantic.⁶

Scientists, scientific farmers, and even political figures advertised and gave encouragement in their own way. As early as 1828, Dr. Thomas Cooper, then President of South Carolina College, expressed an emphatic belief that steam could and should be substituted for brute force in cultivation.⁷ Half a decade later, the versatile and distinguished naturalist, Professor Constantine Rafinesque of Philadelphia, expressed the same sentiments.⁸ During the 1850's speakers before lo-

¹ Horace Greeley, *What I Know of Farming* (New York, 1871), 3, 243.

² *Scientific American*, 22: 60, new series (January 22, 1870).

³ *A List of Patents granted by the United States from April, 1790, to Dec. 31, 1836* (New York, 1872), 168.

⁴ *Niles' Weekly Register*, 46: 426 (August 23, 1834). See also *Genesee Farmer*, 4: 96 (March 22, 1834); *The Cultivator*, 7: 121 (August, 1840).

⁵ See *Farmers' Cabinet*, 5: 291 (April 15, 1841); 7: 309 (May 15, 1843).

⁶ Quoted in *American Agriculturist*, 14: 338 (August 9, 1855). See also *Country Gentleman*, 3: 56 (January 26, 1854).

⁷ *Country Gentleman*, 14: 140 (September 1, 1859).

⁸ *Rpt. Com. Agric. for 1869*, 305.

cal and state agricultural societies spoke confidently of the not-too-distant future when steam plowing would be applied to large American farms and supersede all other means of turning the soil, as Governor Sibley of Minnesota predicted in 1858.⁹ This was the tone of an address made 11 months later before the Wisconsin State Agricultural Society by Abraham Lincoln, who admitted that he had never actually seen a steam plow, but that he had heard of them, and believed that the inventor of a successful one would be worthy of not only public thanks but "something more substantial than thanks."¹⁰

Supporters of steam power augmented their optimistic predictions with arguments. Steam plowing was more economical, they said. Statistics were mustered—often from British sources—to prove that at least one dollar per acre could be saved using steam, not to mention surplus food to be thrown on the markets as animals were displaced on the farm.¹¹ The price of bread was linked directly to production costs, hence if, as one inventor claimed, a steam plow could do with eight men the work of 24 teams and 24 plowmen at one-quarter of the initial investment and one-third of the operating expense, cheaper living costs for all would result.¹²

Steam cultivation was proposed as a means of saving both manpower and horsepower. During the Civil War it was argued that in certain parts of the Border States farmers would be forced to adopt steam power to compensate for the loss of horses and cattle due to the conflict.¹³ The abolition of slavery, said some, would encourage steam tillage in the South, if sufficient capital could be raised.¹⁴ As one eloquent steam plow inventor put it:

To the planters of the South, who are working under the great cloud of a sparse and disorganized labor, we say, here is the grand solution of your problem. Wait not for the advent of the immigrant and the "heathen Chinese," worshipping false gods, but, with the Christian labor around you, harness the mighty power of steam to the car of Ceres and command success.¹⁵

If steam could effect a savings one way or another, according to its disciples, steam cultivation was superior cultivation. It cut deeper, pulverized the soil more completely, and increased the production per acre. "My experience," said a Louisiana

sugar planter in 1869, "fully justifies me in stating that the yield of cane upon the steam plowed and cultivated lands, and with less than half the labor, will be fifty per cent greater than can possibly be obtained by any other mode of cultivation."¹⁶ D. S. Curtis, Secretary of the Wisconsin Agricultural Society, insisted that the steam plow worked cheaply and rapidly and left the soil "mellower and warmer." The farmer could not only till more acres with it, he would automatically be led to a more systematic and orderly agriculture with uniform seeding and ripening because plowing, sowing, and harrowing could all be done at one operation. "The beautiful and healthful operation of producing a kindly, fertile soil," said Curtis, "can in no other way be so surely and economically accomplished as by the employment of steam cultivation."¹⁷

These arguments were often supplemented with more tangible sources of inspiration in the form of monetary awards offered by agricultural societies. Planters of St. Mary's Parish in Louisiana were reported in 1841 to have offered a premium of \$10,000 to anyone producing an efficient steam plow that would turn ten acres a day.¹⁸ Most prizes were not this large, nor even as attractive as the \$5,000 offered jointly in 1858 and 1859 by the Illinois Central Railroad and the Illinois State Agri-

⁹ Merrill E. Jarchow, *The Earth Brought Forth* (St. Paul, 1949), 126. See also *Tenth Annual Rpt. Board of Agric. of State of Ohio* (1855), 14-15, 280.

¹⁰ Address before the Wisconsin State Agricultural Society, Milwaukee (September 30, 1859), in Roy Basler (ed.), *The Collected Works of Abraham Lincoln* (New Brunswick, 1953), 3: 476-477.

¹¹ *Niles' National Register*, 72: 256 (June 19, 1847).

¹² *Chicago Press and Tribune*, September 17, 1859; *American Artisan*, 8: 134, 154-155 (March 3 & 10, 1869); *Scientific American*, 22: 60, new series (January 22, 1870); *Southern Planter & Farmer*, 5: 142, new series (March, 1871); Augustin L. Taveau, "Modern Farming in America," *Rpt. Com. Agric. for 1874*, 282-283.

¹³ *Scientific American*, 9: 121, new series (August 22, 1863).

¹⁴ *American Artisan*, 1: 242 (December 7, 1864).

¹⁵ Quoted in *Rpt. Com. Agric. for 1871*, 283. See also *Rpt. Com. Agric. for 1869*, 298.

¹⁶ *Rpt. Com. Agric. for 1869*, 298. See also H. E. Lawrence, "Steam Plowing in Louisiana," *Rpt. Com. Agric. for 1867*, 278-279; *Mo. Rpt. Dept. Agric. for May & June, 1870*, 213.

¹⁷ D. S. Curtis, "Steam Cultivation," *Rpt. Com. Agric. for 1867*, 277-278.

¹⁸ *American Farmer*, 3: 100, new series (August 4, 1841).

cultural Society,¹⁹ but invariably they called attention to agricultural needs and brought response from American mechanics.²⁰

Under these stimuli, Yankee ingenuity went to work, experimenting simultaneously with several different approaches, which for the sake of expediency may be classified as the cable-drawn approach, the rotary, and the traction. Of at least 90 separate steam plow inventions down to 1877, five would fall definitely in the cable-drawn group, 43 in the rotary category, and 37 under the heading of traction machines, while the nature of five cannot be determined.

The theory behind the cable approach was that the engine must not waste its power in drawing itself across the field. Hence the engine remained on one side of the field, drawing a gang of two-way plows back and forth by means of a cable-windlass arrangement, the cable running round a pulley anchored at the far side. Both engine and anchor could be moved forward along the headlands as plowing progressed.

As early as 1833 a patent was granted to Edmund C. Bellinger of South Carolina for an "agricultural steam apparatus" which utilized this principle,²¹ although the idea never caught hold in the United States. A more expensive variation, widely used abroad, was to employ two engines, one on each side of the

field, alternately drawing the plows back and forth by cable between them.²²

Meanwhile, during the fifties and sixties, the British were advancing the cable approach to a point where it prevailed over all others, thanks mainly to the skill of the English wizard, John Fowler.²³ Not a few Americans, including Commissioner of Agriculture Horace Capron, came to believe that the British had merely capitalized on an idea originally set forth by Bellinger, the South Carolinian. "So Columbus showed others how to discover unknown worlds," said Capron in 1869, "and as the Spaniard lost foothold in territory of his own discovery, so have we, by like supineness, lost the glory of successfully

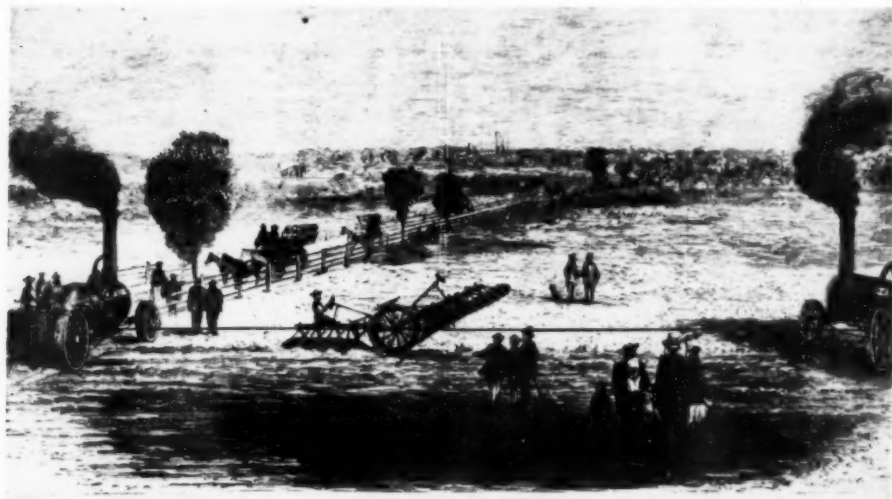
¹⁹ Of this, \$3,000 was offered as first prize, \$2,000 as the second. *Trans. Dept. Agric. of State of Illinois for 1871*, 1: 226, new series.

²⁰ *The Cultivator*, 9: 154 (October, 1842); *Country Gentleman*, 12: 97 (August 12, 1858); *American Agriculturist*, 17: 376 (December, 1858); "Report of the Executive Committee on the Steam Plow Trials at F. export and Chicago," *Trans. Ill. State Agric. Soc.* (1859-1860), 4: 36-38.

²¹ *A List of Patents granted by the United States from April, 1790, to Dec. 31, 1836*, 584; *Country Gentleman*, 14: 140 (September 1, 1859); *Rpt. Com. Agric. for 1869*, 306.

²² See patent of Halbert Paine of Milwaukee. *Rpt. Com. Patents for 1867*, 2: 1112; 4: 877.

²³ For the background of British experimentation, see John Fowler, "On Cultivation by Steam; its Past History and Probable Prospects," *Journal of the Society of Arts and of the Institutions in Union*, 4: 166-177 (February 1, 1856); *Dictionary of National Biography*, 7: 527.



Steam Plow on the Farm of Colonel Patterson, New Jersey

introducing to the admiration of the world what should have been known as the American steam plow."²⁴

Americans were never disinterested in the British plows. Farm editors believed that Fowler's equipment could be utilized effectively on the western prairies, especially if it were not patented in the United States and its production cost could be kept low.²⁵ Americans viewing British steam plows in action at trials of the Royal Agricultural Society or at continental shows admitted that they were workable. But were they economical? The general feeling was that the purchase price of from \$10,000 to \$12,000 was beyond the reach of all but the largest operators, although conceivably a man with enterprise might successfully use them for contract plowing.²⁶

In 1861 Fowler did patent his machine in the United States and there were rumors that it would be introduced into this country.²⁷ However, none arrived for actual field work until 1867, when a double-engine set was imported, accompanied by the former engineer of the Viceroy of Egypt, who reportedly had ordered 100 Fowler engines for use along the Nile. This English "steam missionary," as the *Scientific American* called him, set up the equipment on the Magnolia sugar plantation of Effingham Lawrence, prominent Louisianan and later Congressman.²⁸ Lawrence was so satisfied that he soon acquired two more sets of apparatus and became one of the foremost advocates of steam cultivation in the United States.²⁹

In 1869, Colonel William E. Patterson of Philadelphia demonstrated before a group of notables a double-engine Fowler rig imported for work in his extensive sugar beet fields in New Jersey. The delegation from Franklin Institute were particularly impressed. "This is a wonderful apparatus," they reported. "It iturates the stiffest soil that a Yankee might put it into bladders and vend it as a substitute for snuff."³⁰ But for the cultivation of beets, the machine did not prove satisfactory and was soon acquired by Wade Hampton for his cotton lands in Mississippi.³¹

Actually, few British-made machines were imported. The Commissioner of Agriculture knew of only five by late 1870, although Con-

gress attempted to encourage their introduction by removing the 35 per cent ad valorem duty from steam plowing equipment brought in for private use.³² The Howards, Fowler's chief competitor in England, established an agent in New York in 1871,³³ but neither firm encountered any degree of success on this side of the Atlantic.

Many Americans disagreed with the cable approach from the beginning: it had the British stamp upon it; it was awkward and unwieldy; it departed too radically from the traditional approach. "Our idea of a steam plow is one that will march into the bowels of the land without impediment," said the editor of *Scientific American* in 1865.³⁴ "The machine must traverse the field it plows—tramroads must be obsolete here," echoed the *American Artisan* two years later. "Nothing less will accord with Yankee views and American proclivities."³⁵

²⁴ *Rpt. Com. Agric. for 1869*, 306. Actually one Major Pratt, an Englishman, had patented the cable system in 1810, even before Bellinger. Fowler, "On Cultivation by Steam," *Journal of the Society of Arts*, 4: 167 (February 1, 1856).

²⁵ *Country Gentleman*, 14: 66 (July 28, 1859). See also *American Agriculturist*, 20: 265 (September, 1861); *Trans. Amer. Institute for 1859-1860*, 469, 471.

²⁶ *American Agriculturist*, 21: 293 (October, 1862); *Rpt. Com. Agric. for 1863*, 27; *Trans. Wisc. State Agric. Soc.* (1861-1868), 7: 130-131.

²⁷ *Rpt. Com. Patents for 1861*, 1: 422, 439; 2: 143, 266-267; *American Agriculturist*, 20: 366 (December, 1861). A Fowler rig was scheduled to be displayed at the New York State Fair in 1864, but arrived from England incomplete and could not be exhibited as planned. *Country Gentleman*, 24: 160, 173 (September 8 & 15, 1864).

²⁸ *Scientific American*, 16: 141, new series (March 2, 1867); *American Agriculturist*, 23: 286 (October, 1864); *Country Gentleman*, 29: 145 (February 28, 1867); *Engineering*, 3: 203 (March 1, 1867).

²⁹ Lawrence, "Steam Plowing in Louisiana," *Rpt. Com. Agric. for 1867*, 278-279; *Mo. Rpt. Dept. Agric. for July, 1869*, 301.

³⁰ *Journal of the Franklin Institute*, 88: 31-32 (July, 1869); *Southern Planter & Farmer*, 3: 431-432, new series (July, 1869); *Mo. Rpt. Dept. Agric. for May & June, 1869*, 224.

³¹ *Southern Planter & Farmer*, 5: 414, new series (July, 1871); *Rpt. Com. Agric. for 1869*, 298.

³² *Mo. Rpt. Dept. Agric. for October, 1870*, 425. Duties were removed for two years in 1870 and again in 1872. 16 *U.S. Statutes at Large*, 269; 17 *U.S. Statutes at Large*, 237. Effingham Lawrence had paid a duty of \$4,000 on his first machine, but Congress later remitted the sum. *Engineering*, 3: 203 (March 1, 1867); *American Artisan*, 4: 237 (February 13, 1867).

³³ *Scientific American*, 24: 334, new series (May 20, 1871).

³⁴ *Ibid.*, 3: 151-152, new series (September 2, 1865).

³⁵ *American Artisan*, 4: 504 (June 12, 1867).

Thus several inventors attempted to modify the cable system in such a fashion that the power plant did actually move across the field. The "improved stationary-rope system" of Dr. A. W. Hall of St. Louis, for example, would attach the plows to an engine which "crawled" along a cable by means of a special mechanism of rollers and gears designed to eliminate the traction problem.³⁰ Both Joseph Fawkes of Pennsylvania and Augustin Taveau of Maryland experimented with engines equipped with windlass attachments. The engine was to move up the field at intervals of about 1,000 feet, stopping to draw up the plows by means of its cable drum, then pulling ahead to repeat the process.³⁷

More popular in the United States than the cable-drawn apparatus was the rotary approach—cultivation by means of a series of revolving shares, blades, teeth, or even spades. Rotary plows, insisted their champions, could be made lighter, cheaper, and so as to agitate the soil more thoroughly. Steam was new. Why attempt to harness it to the traditional outmoded plowshare?³⁸

Beginning in the 1850's, Americans were exposed to a veritable rash of plows employing numerous variations of the rotary approach. Some, like that of Colonel C. W. Saladee of Texas or that of Andrew Jackson Stevens of San Francisco, combined plowing, sowing, rolling, and harrowing into a single operation.³⁹ Some utilized spiral blades attached to a revolving cylinder or were equipped with rollers with protruding teeth to "scarify" the soil.⁴⁰ Several attempted to employ revolving screw propellers set at right angles to the line of travel, only to find the friction problem too great.⁴¹ At least one employed a series of rotating blades operating much like those of a Mixmaster;⁴² another tried rotary augers set at an angle in a row at the rear of the engine.⁴³ Some were built around spades striking downward into the ground from a camshaft or gear arrangement,⁴⁴ while others, like the intricate contraction of Elisha Otis of New York, used plowshares attached to an endless moving belt.⁴⁵ One even followed up the tilling blades with "fingers" to separate the earth from the turf, "pickers" to pulverize and shake the soil free, and a roller and "sifter"

device to convey roots and weeds to a box at the rear.⁴⁶

A few of these rotary machines achieved at least momentary success, as did the one invented by Philander H. Standish of California and described by an imaginative newspaperman in 1869:

From the back windows of our sanctum we look out upon the smoke of the steam plow as it courses back and forth over the adobe flats, cutting its twelve-foot swath, tearing up the annis and soap roots, and leaving them free from dirt to wither and die in the sun, plowing at sometimes two miles per hour, and giving the tough, dry, sun-baked adobe such a cutting and turning, raking and stirring, mixing and whirling, airing and pulverizing as it never got before.⁴⁷

³⁰ *Ibid.*, 8: 133-134, 154-155 (March 3 & 10, 1869); *Rpt. Com. Patents for 1863*, 1: 377; 2: 147; J. Brainard, "History of American Inventions for Cultivation by Steam," *Rpt. Com. Agric. for 1867*, 260. Another version of a modified cable approach appears in *Specifications & Drawings of Patents for June, 1873*, 153, 485-487.

³⁷ *Rpt. Com. Patents for 1861* ("Arts and Manufactures"), 1: 599-600; 2: 417; MS copy of specifications filed May 4, 1872 with the Commissioner of Patents by Augustin Taveau. Taveau MSS, microfilm courtesy of Duke University Libraries.

³⁸ *Country Gentleman*, 16: 123 (August 23, 1860); *The Plough, the Loom, and the Anvil*, 3: 243 (October, 1850); M. L. Dunlap, "Agricultural Machinery," *Rpt. Com. Agric. for 1863*, 420-421.

³⁹ *Rpt. Com. Patents for 1861* ("Arts and Manufactures"), 1: 395-396; 2: 242; *Rpt. Com. Patents for 1869*, 2: 430. Saladee's machine was constructed by Huns-worth, Eagan & Co. of Philadelphia, and it was reported that its inventor—the operator of the Pine Island Farm near Galveston—would receive a large land grant from the State of Texas if it proved successful. *Scientific American*, 2: 243, new series (April 14, 1860); 4: 145-146 (March 9, 1861).

⁴⁰ See machines of Anson Thayer and E. H. Hawley. *American Artisan*, 8: 156 (March 10, 1860); *Scientific American*, 10: 353-354, new series (June 4, 1864).

⁴¹ See machines of J. R. Gray of Wisconsin and Linus Stewart of San Francisco. *Rpt. Com. Patents for 1857*, 1: 191, 396; 2: 726; *Rpt. Com. Patents for 1869*, 2: 282; 3: 680.

⁴² See machine of James Fogarty of Newark. *Specifications & Drawings of Patents for March, 1875*, 158, 487.

⁴³ *Ibid.* (December, 1876), 167, 513-515.

⁴⁴ See the spading machines of Samuel Reynolds and N. H. Gray. *Rpt. Com. Patents for 1862*, 1: 340; 2: 175; *Rpt. Com. Patents for 1868*, 1: 842; 3: 520.

⁴⁵ *Rpt. Com. Patents for 1857*, 1: 191, 396; 2: 721.

⁴⁶ See machine of Benjamin Benson of Baltimore. *Specifications & Drawings of Patents for December, 1875*, 303, 927.

⁴⁷ Quoted in *American Artisan*, 9: 347 (December 1, 1869). For further information see *Scientific American*, 23: 277, new series (October 29, 1870); *Rpt. Com. Patents for 1868*, 1: 682; 3: 299; F. Hal Higgins, "Letters of Philander H. Standish," *Agricultural History*, 31: 8-18 (April, 1957).

But for all practical purposes, most of the rotary steam plows—like the others—were too heavy, too complex, and too expensive. "Paddy and his spade are veritable economic institutions," said one writer in 1859, "and for all the rotary digger may accomplish, will so continue."⁴⁸ This was by no means an inaccurate prediction.

It was the direct traction approach, drawing conventional plowshares through the soil, that promised most for the future. Agricultural periodicals were excitedly describing such machines as early as 1834, when Major Amos Tyrell's "combined wheel plow" awed the farmers of Genesee County, New York, and seemed to presage a great new era.

We hope yet to see a steam engine attack a forest, take up the trees and shake the soil from their roots like onions, stuff them under its boiler, plow and seed the ground, and all this at the rate of an acre per hour. Hurrah for the teakettle! Success to the steam farmer!

So wrote the awe struck editor of the Baltimore *Farmer & Gardener*.⁴⁹

In the 1840's, John Larkin's double-engine traction plow and Henry Cowling's monster "Steam Plough, Land Locomotive, and Machine of All Work" showed mechanical ingenuity⁵⁰ but in the end only served as unsuccessful milestones to usher in more numerous attempts in the fifties and sixties. One of the most publicized of these was that of Obed Hussey, better known for his pioneering work with the reaper. Hussey's steam plow captivated crowds at the fair of the Maryland State Agricultural Society in 1855 and won awards in Indiana and New York in subsequent years, but the inventor was unable to raise sufficient capital or to devise workable shares before his death in 1860.⁵¹

Hard on Hussey's heels came Joseph W. Fawkes of Pennsylvania, who in 1858, after three years of experimentation, publicly unveiled his ten-ton behemoth, the "Lancaster," for the first time. Eighteen feet long, with power imparted through a large driving drum rather than drive-wheels, the machine was the darling of the Illinois State Fair in 1858 and again in 1859 and won for its builder an award of \$1,500.⁵² "The excitement of the crowd was beyond control, and their shouts and wild huzzas echoed far out over the prairie," said a Chicago editor in

1858, "as there, beneath the smiling Autumn sun, lay the first furrow turned by steam on the broad prairies of the mighty West."⁵³ Improved models of Fawkes' machine won additional honors from the Franklin Institute, the American Institute of the City of New York, the Pennsylvania State Agricultural Society, and the United States Agricultural Society,⁵⁴ but ultimately, after nearly a decade of experimentation, Fawkes admitted defeat.

Countless other traction plows are undoubtedly worthy of mention did time and space permit. That invented by James Waters of Detroit proved Fawkes' most persistent competitor at various agricultural shows of the Middle West, but though it did plow some 300 acres under contract, it also succumbed to the same difficulties that plagued the machine of the Pennsylvanian.⁵⁵ Much less orthodox was Peirce Klinge's invention of the same period. With engine and boiler set amid an odd shaped frame, a single large plowshare at each end, it was meant to move either forward or backward across the field, thus avoiding loss of time in turning.⁵⁶ Even more unusual in appearance was the Burrige

⁴⁸ M. L. Dunlap, "Plowing by Steam," *Trans. Ill. State Agric. Soc.* (1859-1860), 4: 684.

⁴⁹ *Farmer & Gardener*, 1: 169 (September 30, 1834); *Genesee Farmer*, 4: 271 (August 23, 1834); *Niles' Weekly Register*, 47: 102 (October 18, 1834).

⁵⁰ Larkin employed two engines operating from a single boiler to power up to eight plowshares attached to the rear of his machine. Observers were optimistic but apparently its traction problems could not be solved. *American Farmer*, 3: 403 (May 11, 1842); *The Cultivator*, 9: 154 (October, 1842). Cowling's machine had driving wheels 16 feet high and was represented as being able to haul 15 plows. *Farmer and Mechanic*, 3: 556, new series (November 22, 1849).

⁵¹ *Country Gentleman*, 6: 364-365 (December 6, 1855); *American Farmer*, 11: 162, 177 (December, 1855); *Scientific American*, 12: 341 (July 4, 1857).

⁵² *Biographical Annals of Lancaster County, Pennsylvania* (n.p., 1903), 23-24; *Lancaster Daily Evening Express*, November 16, 1858; *Rpt. Com. Patents for 1858*, 1: 366; *American Agriculturist*, 17: 376 (December, 1858); 18: 329 (November, 1859); *Trans. Ill. State Agric. Soc.* (1859-1860), 4: 36-38.

⁵³ *Chicago Press and Tribune*, September 23, 1858.

⁵⁴ *Journal of the Franklin Institute*, 48: 215 (September, 1859); *Philadelphia Public Ledger*, July 23, 1859; *Scientific American*, 2: 211, new series (March 31, 1860); *Trans. Amer. Institute for 1859-1860*, 75, 471.

⁵⁵ For Waters' futile endeavors see *Chicago Press and Tribune*, September 19, 1859; *Country Gentleman*, 14: 203, 253, 379 (September 29, October 20, & December 15, 1859); Dunlap, "Plowing by Steam," *Trans. Ill. State Agric. Soc.* (1859-1860), 4: 680.

⁵⁶ *Rpt. Com. Patents for 1858*, 1: 465; 3: 86.

steam plow, patented in 1860. Twin engines mounted on a platform suspended inside a large iron cylinder, ten feet long and ten feet in diameter, imparted motion through a cog to the cylinder, thus providing traction power to impel the machine forward, pulling a gang of plows attached to the rear. Trials indicated sufficient traction, but its unwieldy character and its inapplicability for other farm purposes marked it as merely another impractical experiment.⁵⁷

Traction, of course, was a major problem, and numerous devices were employed in attempts to increase hauling power. The boat-shaped contrivance of John Reynolds, for example, endeavored to meet the problem with special lightweight construction and wheels set exceptionally wide.⁵⁸ Fawkes vainly fastened wooden cleats to his driving drum when the machine bogged down in soft soil.⁵⁹ John Delavigne of New Orleans set the wheels of his engine outside the plowed swath and let them run on an unplowed strip which would be turned later by horse.⁶⁰ Another inventor designed special

wheels with protruding spikes which withdrew as the wheels turned.⁶¹ D. D. Williamson's machine, which enjoyed more than the usual measure of success in the 1870's, was powered by a British Thomson engine equipped with distinctive rubber tires.⁶² Several plowing engines appeared with blocks shaped like horses' hoofs fastened along the edge of the drive wheels.⁶³

The caterpillar tread was not uncommon. The machine of Thomas Minnes of Pennsyl-

⁵⁷ *Rpt. Com. Patents for 1860*, 1: 559; 2: 373; Brainard, "History of American Inventions for Cultivation by Steam," *Rpt. Com. Agric. for 1867*, 257.

⁵⁸ *Rpt. Com. Patents for 1860*, 1: 793; 2: 635; *Scientific American*, 4: 65, new series (February 2, 1861).

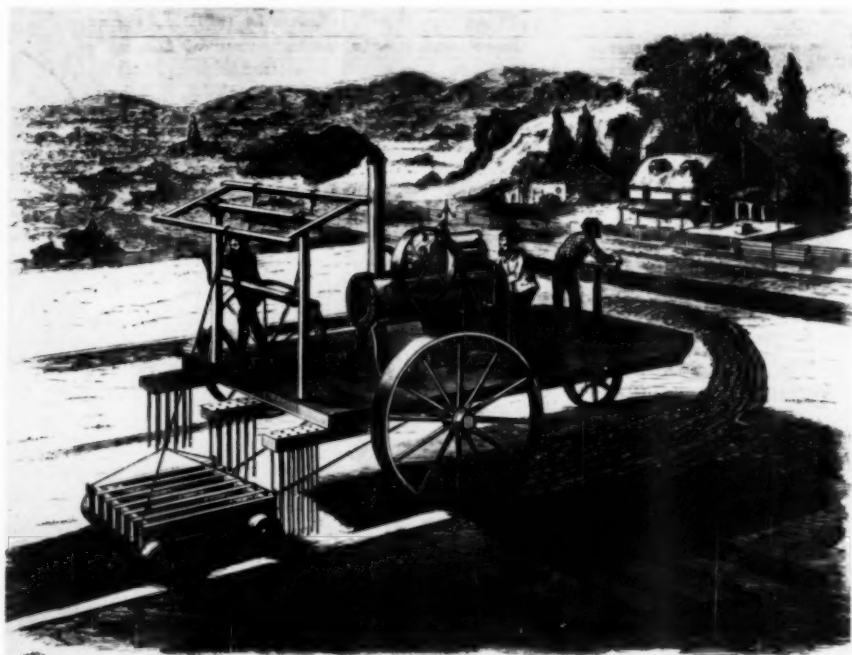
⁵⁹ *Trans. Ill. State Agric. Soc.* (1859-1860), 4: 36-37.

⁶⁰ *Scientific American*, 19: 289, new series (November 4, 1868).

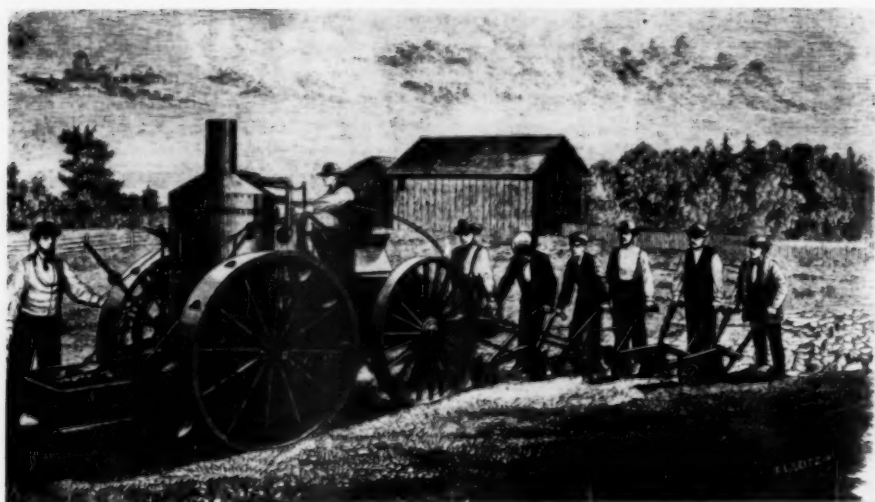
⁶¹ See machine of Owen Redmond of Rochester, illustrated in this article.

⁶² Williamson's machines were versatile, widely publicized, and impressive. See *Country Gentleman*, 38: 21 (January 9, 1873); *Mo. Rpt. Dept. Agric. for November & December, 1872*, 517-518. For typical publicity see D. D. Williamson, *Steam Plowing* (New York, 1873), 1-46.

⁶³ *Rpt. Com. Agric. for 1871*, 213.



Delavigne's Patent Steam Plow and Cultivator



Redmond's Steam Plow

vania utilized two 15-horsepower engines, one on each side of the boiler, each operating an endless chain track.⁶⁴ That of Robert Parvin employed a "half-track" arrangement, and did "some remarkable work," according to observers.⁶⁵ A more radical approach were contrivances designed to be propelled by "legs," pushing or pulling engine and plows along. The Townley-Friedrich machine of 1869, for example, had the frame resting on broad rollers, the whole supposedly impelled by a series of spring "feet" that "walked" forward by means of power from a camshaft assembly.⁶⁶ And almost beyond the bounds of description was the weird device patented by Joseph Knapp of Wisconsin in the same year. It employed a mechanism contrived to move itself forward and plow alternately: the machine crawled ahead crab-like, anchored itself by special "arms," then the plow was supposed to agitate the soil by moving to and fro in an arc.⁶⁷

Undoubtedly many of these ideas—such as Knapp's or Taveau's—existed only on paper. But a sizable number, especially of rotary or traction design, were translated into actual working models and were field tested. And, in general, they have to be regarded as failures—usually as a result of many of the same adverse factors.

On the one hand, if we may believe the ex-

ponents of steam culture, traditional rural reluctance to accept change was not easy to overcome. One of the country's largest engine manufacturers commented in 1871 that "It has taken fifteen years, and millions of capital, to educate the farmers to the point of using steam for any purpose; and there is not one neighborhood in a thousand where they believe in it yet."⁶⁸ Augustin Taveau expressed open disgust with the American farmer's basic conservatism, insisting that successful agriculture must employ the most modern of techniques and equipment. If the steam plow was not of prime significance yet, he suggested in 1874, it was because the farmer himself had "clogged its wheels with incredulity and prejudice."⁶⁹

On the other hand, the press, in attempting to combat rural inertia, often inadvertently contributed to it. Too frequently comments

⁶⁴ A description of this machine in action is in *Rpt. Com. Agric. for 1870*, 511.

⁶⁵ Manufactured at Farmington, Illinois, the machine was "successfully" tested near Philadelphia and in California. *Rpt. Com. Agric. for 1871*, 213-214; *Mo. Rpt. Dept. Agric. for January, 1874*, 6.

⁶⁶ *Rpt. Com. Patents for 1869*, 2: 144; 3: 445; *Rpt. Com. Agric. for 1869*, 317.

⁶⁷ *Rpt. Com. Patents for 1869*, 2: 697; *Rpt. Com. Agric. for 1869*, 317.

⁶⁸ Quoted in *Rpt. Com. Agric. for 1871*, 283.

⁶⁹ Taveau, "Modern Farming in America," *Rpt. Com. Agric. for 1874*, 281-282.

of agricultural periodicals were extremely laudatory and slanted with preposterous predictions of performance that they could never be realized. When machines fell short—as they invariably did—public opinion naturally reacted in a negative fashion.

Probably more important was the expense obstacle. Most inventors were hard pressed to raise capital even for test models, not to mention the manufacture of plows for the public. Taveau, for example, sorely neglected his family while he solicited support from Ohio businessmen—"these vulgar creatures," as he termed them bitterly; but no aid was forthcoming and his machine was never built.⁷⁰ Fawkes and some of the others were more fortunate in raising initial capital, but with the machines' failures, the contributors—including Horace Greeley—lost their investments.⁷¹

Joint-stock companies were frequently suggested as a means of developing steam plow equipment, but few actually materialized.⁷² M. E. Dunlap, an acute observer who estimated that \$200,000 had been expended in individual efforts in America by 1863, believed that Congress ought to provide funds for steam cultivation experiments conducted by the Commissioner of Agriculture.⁷³ But federal aid was not offered and private capital flowed instead into more lucrative areas.

Nor could the average farmer be expected to invest in the immense, complicated machines placed before them by the inventors. British imports at \$10,000 were obviously out of the question for all but the most prosperous gentlemen farmers. So too were most American-built models, normally priced at from \$3,000 to \$5,000⁷⁴—roughly the price of an improved farm. A few cheaper ones were proposed, but nearly all failed to clear the drawing boards.⁷⁵ And despite inventors' claims to the contrary, it was clear that early steam plows were not cheap to operate. Farm experts estimated that plowing by horse could be done for \$1.25 per acre, while the job with a steam rig such as Fawkes' or Waters' would cost at least twice that.⁷⁶

One of the main reasons for expense—both of purchase and of operation—was the size and complexity of most machines. Mechanics had yet to devise a satisfactory power-weight ratio. In order to produce sufficient power,

engines had to be so heavy that they bogged down. "Steam plows, steam seed planters, steam cultivators, and steam harvesters, are wanted everywhere," said the editor of *Scientific American* in 1871. But our farmers must have small, strong, simple, and reliable machines."⁷⁷ What was needed, said Horace Greeley in the same year, was a farm locomotive costing no more than \$500, weighing only a ton when completely loaded, yet able not only to plow, but to do other types of farm work as well.⁷⁸

But in general, what was being offered were engines of "elephantine proportions and weight,"⁷⁹ with prices to correspond. No doubt the criticism made by a former Commissioner of Patents in 1861 of Jesse Frye's "steam horse of-all-work"—"There is too much of it"⁸⁰—could rightfully be applied to the vast majority of steam plows invented before the 1880's.

Many of those working to apply steam to tillage were amateurs; often they were unfamiliar with the basic requirements of the farmer. Some had made outstanding contri-

⁷⁰ Taveau to wife, February 26, 1872; Taveau to Roland Rhett, June 20, 1881. Taveau MSS.

⁷¹ Greeley admittedly lost \$1,200 on the Fawkes machine. *Trans. Amer. Institute for 1867-1868*, 170. Another example is cited in *American Artisan*, 4: 504 (June 12, 1867).

⁷² *Scientific American*, 11: 364 (July 26, 1856); *Country Gentleman*, 15: 377-378, 410 (June 14 & 28, 1860). Kiddy's Patent Traction Engine, Steam Plow and Land Cultivation Company (capital stock \$50,000) advertised in 1859 that it was in business to sell Thomas Kiddy's rotary-type machine and to plow on a contract basis. *Moore's Rural New-Yorker*, 10: 118, 222 (April 9 & July 9, 1859).

⁷³ Dunlap, "Agricultural Machinery," *Rpt. Com. Agric. for 1863*, 422-423.

⁷⁴ Estimated prices for various machines were: Larkin's, \$3,000-\$4,000; Fawkes and Waters', at least \$4,000; Parvin's, \$4,000; Williamson's, small model, \$4,500, large model, \$5,000. *American Farmer*, 3: 403, new series (May 11, 1842); *Country Gentleman*, 37: 741 (November 21, 1872); *Trans. Ill. State Agric. Soc.* (1859-1860), 4: 680, 683; *Mo. Rpt. Dept. Agric. for January, 1874*, 6.

⁷⁵ Hall's "improved stationary-rope system," for example, was supposed to sell for \$1,900. *American Artisan*, 8: 134 (March 3, 1869).

⁷⁶ Dunlap, "Plowing by Steam," *Trans. Ill. State Agric. Soc.* (1859-1860), 4: 683-684.

⁷⁷ *Scientific American*, 24: 374, new series (June 10, 1871).

⁷⁸ Greeley, *What I Know of Farming*, 244.

⁷⁹ *Rpt. Com. Agric. for 1869*, 306.

⁸⁰ Charles M. Remey (ed.), *Life and Letters of Charles Mason* (Washington, 1939), 3: 406. For a description of Frye's mammoth apparatus, designed to plow 160 acres a day, see *Trans. Amer. Institute for 1860-1861*, 609.

butions in other fields: Elias Howe and the sewing machine, Elisha Otis and the safety elevator, Samuel Reynolds and equipment for manufacturing nails. But even these men proved unable to surmount the obstacles that clogged the way to successful steam plowing.⁸¹ Far too many of the inventors—well-known and obscure alike—were forced, for economic reasons, to build their entire apparatus, including the power plant, “from the ground up,” rather than to begin with the best engine available.

Even the best engines available were none too good. Most were designed for stationary belt work, not for traction. Only when the steam engine itself was improved, as it was in the 1880's and 1890's, would the steam plow become practicable. Only when steel gearing replaced iron; when greater structural strength was incorporated; when more effective driving wheels were devised; when greatly expanded water and fuel capacities

were added—only then would plowing by steam become common, and then only on the relatively flat, level lands of the prairies. With such improvements, even though loss of energy in self-propulsion was still enormous, huge steam monsters of as many as 120 horse power churned across the broad wheatlands of the American and Canadian West, drawing 20 or 30 plows and turning 50 or 75 acres per day.⁸² Hardly had the age of steam arrived, however, when it was interrupted by the advent of the internal combustion engine which would soon replace the snorting, puffing giant that men had tried so long to tame.

⁸¹ See *Scientific American*, 13: 151-152, new series (September 2, 1865); *Rpt. Com. Patents for 1857*, 1: 191, 396; 2: 721; *Rpt. Com. Patents for 1862*, 1: 340; 2: 443; *Dictionary of American Biography*, 14: 93-94; 15: 522.

⁸² See Edward A. Rumeley, “The Passing of the Man with the Hoe,” *World's Work*, 20: 13246-13258 (August 4, 1910); Reynold M. Wik, *Steam Power on the American Farm* (Philadelphia, 1953), 93-96.

FRESH AIR ADDICT

We know it is cool, that the air is chill, but it is pure for all. Build a fire, open the windows and let in the air. We need to live more in open air. We may live so indoors if we once get in the habit. Poor, puny, disconsolate looking men and women will become plump, healthful and happy. Live with the windows open—open from the top as well as the bottom. Let there be a circulation of air. Follow this advice, and each reader of the journal will live years longer, and enjoy more each year than they do.

From *Journal of Agriculture* (1858)

THE SEX OF EGGS

M. Genin has addressed the *Academie des Sciences* on this subject. After three years study, he says he is able to state with assurance that all eggs containing the germs of males have wrinkles on their smaller ends, while female eggs are equally smooth at both extremities.

From *Journal of Agriculture* (1858)

PREVENTING SUN STROKE

A few green leaves worn inside of the crown of the hat, it is said, will secure one against all danger from sun stroke. A friend, who tried to experiment during some of the warmest days, found that his head became far less heated than usual, when protected by two or three grape leaves. Farmers and others who are exposed to the scorching rays of the sun should try this method of protecting themselves.

From *Journal of Agriculture* (1858)

*Southern Output and Agricultural Income, 1860-1880**

EUGENE M. LERNER

Wherever war touched the South—whether in its “peculiar institution,” in its farms, factories or homes, the aftermath was disorganization, ruin, and suffering. For more than two centuries Southerners had lived with the institution of slavery. Now that institution crumbled. As Federal armies successfully overran the Southern states, many freed men tested their new-found liberty by wandering aimlessly into the cities and towns, or by trailing after the advancing Union armies. Some went to other states, while many others drifted back to their old plantation homes where they eventually had to learn the responsibilities of free men. Of those who wandered, uncounted thousands died by the wayside of typhoid or other epidemic diseases;¹ many, unable or unwilling to find work were driven by hunger to petty theft. It was alleged that no chicken roost was safe. Confederate soldiers returned to their farms to find their livestock decimated, their acres gone to weeds, their tools in need of repair. General Pemberton, Chief of the Confederate forces at Vicksburg and a wealthy man in prewar days, was reduced to pulling his own plow in order to plant his first postwar crop. His horses had been killed or stolen. Factories were razed to the ground, machinery was worn out and wrecked, houses and barns were burned. In Louisiana a plantation was sold for \$6,000 in 1865; the same plantation was valued at \$100,000 before the war.

Although there are no inventories of the South's agricultural capacity or physical capital at the close of the war, the several series presented in Table 1² give some idea of how great was the physical and dollar cost of the Civil War.³ These series compare the South of 1870, after five full years of recovery, with the South of 1860. Even though they therefore understate the war's destruction, the series still present a startling picture: the number of horses in the 11 states of the Confederacy fell by 29 per cent from 1860 to 1870; the number of cows fell by 32 per cent; the number of swine was reduced by 35 per cent; the value of farm implements declined

by 46 per cent, and the value of the farms themselves fell almost by half.

During the decade, 1870-1880, the physical capital destroyed by war was replaced and by 1880, 15 years after the end of the war, most of the series reached or exceeded their 1860 levels. The number of cattle (other than cows) and acres of farms in the South were almost as great in 1880 as they were in 1860; the number of horses, mules, cows and improved acres in the South ranged from 4 to 27 per cent higher. However, in spite of this growth of resources, the value series, though generally higher in 1880 than in 1870, were still below their 1860 levels. In 1880 the value of farms was 33 per cent below its 1860 level, the value of farm implements was 31 per cent lower and the value of livestock was down 24 per cent. This disparity between the degree of recovery of the physical series on the one hand and the value series on the other requires further analysis.

During the decade of the 1860's, though agricultural capacity fell drastically in the South, it expanded in the rest of the country. For example, in 1860 there were 6.5 million horses in the United States and of these, 1.7 million were in the South. In 1870 there were 7.3 million horses in the United States but only 1.2 million in the South.

During the decade of the 1870's, however, many agricultural resources expanded more rapidly in the South than in the country as a whole. In spite of the rapid western expansion of the country during this decade, the South in 1880 held a larger percentage than

* This paper was prepared while Mr. Lerner was a Research Assistant at the National Bureau of Economic Research. He wants to thank George Stigler, Clarence Long, and Solomon Fabricant for reading and criticizing earlier drafts of this paper.

¹ U. B. Phillips, “Plantations with Slave Labor and Free,” *Agricultural History*, 12: 90 (January, 1938).

² The census data, the source of this table, are notorious for underreporting items in the rural South, especially in 1870. It is difficult to correct for this defect, and as a result, the data must not be “pressed” too hard. The data are more illustrative of a general condition than assertions of positive values.

³ None of the series presented is a strict capacity measure. Rather, they show changes in the stock of some of the resources used to produce agricultural output.

TABLE I
Indicators of Southern* Agricultural Capital and Capacity at Selected Dates
1850 to 1880
(in thousands)

	No. in South	No. in South as a % of No. in U.S.	Index: 1860 = 100	No. in South	No. in South as a % of No. in U.S.	Index: 1860 = 100
	Horses			Mules		
1880	2,083.0	20.1	119.4	1,044.8	57.6	127.0
1870	1,246.2	17.4	71.5	613.5	54.5	74.6
1860	1,743.8	27.1	100.0	822.7	71.5	100.0
1850	1,421.0	32.7	81.5	405.3	72.4	49.3
	Milch Cows			Working Oxen		
1880	2,817.9	22.6	104.1	517.6	52.0	60.6
1870	1,852.3	20.7	68.4	507.6	38.4	59.5
1860	2,705.7	31.5	100.0	853.6	37.8	100.0
1850	2,248.5	35.2	83.1	603.6	35.4	70.7
	Swine			Other Cattle		
1880	13,509.9	28.3	86.8	7,264.4	32.3	96.2
1870	10,122.6	40.2	65.0	3,623.8	26.7	48.0
1860	15,562.7	46.4	100.0	7,554.0	57.1	100.0
1850	15,804.1	52.0	101.6	4,491.4	46.3	59.4
	Acres of Farms			Improved Acres		
1880	197,002.4	36.7	98.3	67,350.6	23.6	118.5
1870	156,791.1	38.5	78.2	46,987.1	24.8	82.7
1860	200,476.3	49.2	100.0	56,832.1	34.8	100.0
1850				43,224.9	38.2	76.0
	Values of Farms			Value of Farm Implements		
1880	1,234,958.4	12.1	66.7	57,637.4	14.1	69.5
1870	977,142.3	10.5	52.8	45,145.3	13.4	54.4
1860	1,850,708.5	27.8	100.0	82,971.4	33.7	100.0
1850	793,344.1	24.2	42.9	53,221.3	35.1	64.1
	Value of Livestock					
1880	276,708.1	18.6	76.4			
1870	279,685.0	18.3	77.2			
1860	362,163.1	33.2	100.0			
1850	196,327.8	36.0	54.2			

* The South is defined as the 11 states that seceded from the Union.
Source: Tenth Census of the United States, Vol. 3.

it did in 1870 of all, except three, of the series examined. The exceptions were: acres in farms, the number of improved acres and the number of swine.

Southern manufacturing⁴ during the 15 years after the Civil War followed a much different course. Table 2 presents several series derived from the United States Census of Manufactures. In every case, the manufacturing series in 1870 are above the corresponding 1860 figures. The number of firms increased by almost 80 per cent between 1860 and 1870; the amount of capital increased by 3 per cent, and the number of laborers by 30 per cent. Some of the manufacturing series presented in Table 2 measure changes in output or cost of output rather than changes in capacity and so are not di-

rectly comparable to the agricultural series.⁵ Viewed as a group, however, they suggest a very clear picture: while the resources and output of agriculture fell during the decade 1860-1870, the resources and output of manufacturing increased.

During the decade 1870-1880, the manufacturing series generally show a slight drop in the ratio of the South to the country as a whole. Unfortunately, the many errors in

⁴ The United States Census at this time included, under manufacturing, the output of artisans, such as blacksmiths, carpenters, and the like, some extractive industries, such as lumbering as well as that of mills and factories. The term manufacturing as used in this paper refers to this broad census definition.

⁵ Later in this article agricultural output will be investigated directly. Anticipating the conclusions, there is a close conformity between the agricultural output series and the capacity series.

TABLE 2
Indicators of Southern Manufacturing
1850 to 1880

	1850	1860	1870	1880
<i>No. of Establishments</i>				
Establishments in South	123,025	140,433	252,148	253,852
Per Cent of U.S.	13.7	14.7	12.3	11.5
Index, 1860 = 100	87.6	100.0	179.5	180.8
<i>Capital *</i>				
Capital in South (in millions)	55.3	96.0	98.7	133.3
Per Cent of U.S.	10.4	9.5	4.6	4.8
Index, 1860 = 100	57.6	100.0	102.8	138.8
<i>No. of Laborers *</i>				
No. of Laborers	88,390	110,721	144,252	171,674
Per Cent of U.S.	9.2	8.4	7.0	6.3
Index, 1860 = 100	79.8	100.0	130.3	155.0
<i>Cost of Labor</i>				
Wages (in millions)	17.5	28.7	31.0	37.1
Per Cent of U.S.	7.4	7.6	4.0	3.9
Index, 1860 = 100	61.0	100.0	108.0	129.3
<i>Cost of Raw Materials</i>				
Cost of Raw Materials (in millions)	40.8	86.5	116.2	151.8
Per Cent of U.S.	7.4	8.4	4.7	4.5
Index, 1860 = 100	47.2	100.0	134.3	175.5
<i>Value of Products</i>				
Value of Products (in millions)	79.2	155.5	199.0	240.5
Per Cent of U.S.	7.8	8.2	4.7	4.5
Index, 1860 = 100	50.9	100.0	127.9	154.6

* Both series exclude slaves.

Source: *United States Census*, various years.

collecting and processing these early census returns make small percentage changes untrustworthy. However, the census figure must be accurate enough to warrant the conclusion that while many resources used in agriculture expanded more rapidly in the South than in the United States as a whole between 1870 and 1880, many in manufacturing did not.

Why did Southern manufacturing recover so rapidly from the war in the late 1860's and Southern agriculture so slowly? Why did it take until 1880 for the agricultural series to equal their 1860 level when the manufacturing had already surpassed their prewar level in 1870? Why, during the 1870's, did the rate of growth of Southern agricultural capital rise relative to that of the nation as a whole while the rate of growth of manufacturing did not? To answer these questions, the economy of the South during the Civil War, as well as during the postwar period, must be examined.

During the war, Northern ships blockaded the Confederate ports and neither exports, such as cotton and tobacco, nor imports, like manufactured goods, could move easily in or out of the South. In consequence, the price

of exports tended to be depressed and the price of imports to be raised.⁶ In an effort to bolster their income, planters sent petitions to the Confederate Secretary of the Treasury urging that the Confederate Government buy the cotton crop outright or advance a loan on the growing crop. These proposals were rejected for a number of reasons, one of which was that the South needed grain and provisions and the subsidizing of cotton would eliminate the incentive to change crop outputs.⁷

The inaccessibility of foreign markets caused by the Northern blockade and the refusal of the Confederate government to extend aid on the cotton crop were powerful incentives for planters to reduce their output of cotton. However, it is less certain that the output of other crops expanded. Indeed, it is more likely that their output also fell.

The war exacted a heavy drain on both agricultural manpower and horses. The old

⁶ For a more complete statement of the behavior of Southern prices during the Civil War, see Eugene M. Lerner, "Money, Prices and Wages in the Confederacy, 1861-65," *The Journal of Political Economy*, 63: 28 (February, 1955).

⁷ Eugene M. Lerner, "The Monetary and Fiscal Programs of the Confederate Government, 1861-65," *The Journal of Political Economy*, 62: 514 (December, 1954).

men, women, and children left at home could not manage their farms and slaves as well as the men called to the army. To help correct this decrease in efficiency, legislation was introduced to exempt men from the army if they owned 20 or more slaves. However, this bill quickly gave rise to the complaint "a rich man's war and a poor man's fight," and the measure was dropped. Agricultural inefficiency remained.

What alternatives faced the women left on the farms when their husbands were called to war? One was to try and get along as well as possible, and many of course did just that. Many other women, however, left their plantations and found jobs in industry.

As the blockade restricted the import of many manufactured products, Southern manufacturers tried to expand their output of these commodities. New iron works were opened up in Alabama and Virginia and new textile mills were started in the Carolinas. Commodity prices rose faster than wage rates, and this lag undoubtedly increased profits, stimulating the output of all manufactured goods as well as the increase in new plant and equipment. The Confederate Government opened quartermaster supply depots in the larger towns and operated salt works, nitrate mines, and ordnance factories. New and expanded enterprises needed laborers. The Confederate army sent troops back from the front to work in war plants. Thousands of women and girls took jobs for the first time in their lives in clothing shops. Manufacturing establishments also began to advertise for slave labor. The Macon Armory advertised for 100 hands; the Tredegar Iron Works wanted 1,000; the Naval Gun Foundry and Ordnance Works at Selma wanted 200; the salt works in Clark County, Alabama, advertised for 500; and the railroads wanted Negroes by the thousands. Almost every industry was competing for Negro labor. Plantation owners, attracted by relatively high returns, rented more and more of their slaves to mills, factories, and railroads.

The blockade, the price-wage lag, and the increased military demand for manufactured products discouraged the production of exports and stimulated the output of manufactured goods previously imported. The war drained the agricultural management class

and encouraged the people left at home to shift their resources out of agriculture and into manufacturing. Combined, these forces tended to reduce agricultural output and expand manufacturing capital and output during the war. Consequently, while there were offsets in manufacturing to the destruction of war, there were no comparable incentives working to encourage agriculture.

After the war, the South's farm labor force, predominantly Negro, became seriously disorganized, thus retarding the recovery of agriculture. The manufacturing labor force, on the other hand, was predominantly white and quickly reorganized.

A pressing farm problem at the end of the war was to get the Negroes to work effectively in the fields. The problems of William Minor, a Louisiana plantation owner, were typical. He wrote in his diary on January 3, 1863:

Find the negroes are completely demoralised—They are practically free—Going, coming & working when they please & as they please. They destroy everything on the plantation. In one night they killed 30 hogs. They have stolen a number of my best Sd. [Southdown] sheep & sold them in Houma at \$1 each. They will not shut a gate or put up a fence; they ride the mules off at night & at all times. The most of them think, or pretend to think, that the plantation & every thing on it belongs to them. . . .⁵

Later in the year Minor described conditions near New Orleans. Some fields appeared to be in good order, but many "were only partially cultivated & some were totally abandoned." He wrote: "The negroes everywhere [are] greatly demoralized, being insolent & idle—working not more than half a day, yet demanding full rations of *every thing*." Conditions had so deteriorated that the planters patrolled the river parishes to watch over their property and guard against the wandering Negroes.⁶

Minor found that wages were not sufficient inducement to keep his Negroes at work so long as they had assurance of rations. He therefore "instructed his overseer to deduct one day's rations for every day a laborer failed to work. As for the married women, who seemed more averse to working than any of

⁵ J. Carlyle Sitterson, "Transition from Slave to Free Economy on the William J. Minor Plantation," *Agricultural History*, 17: 218-219 (October, 1943).

⁶ *Ibid.*, 220.

the others, their husbands were to be charged for their rations." Minor also explicitly instructed his overseers to use the greatest forbearance and prudence in supervising the Negroes. "They must be got back to the old way of doing business by degrees. Everything must be done to encourage & make them work before resorting to corporeal punishment—If they will not work without it, it must be resorted to & inflicted in a proper manner—To do this you must not punish when you, or the negro to be punished, is *in a passion*." On the other hand, when the Negroes behaved well, they were given occasional leave to town.¹⁰

The host of problems associated with the transition of Negroes from slavery to freedom could only be solved with the passing of time. To link laborers' income immediately with their continued output over a crop year, share cropping and tenant farming developed. Other Negroes were paid only part of their salary at the end of each month and the remainder at the end of the season, if they worked throughout it. In North Carolina, at least, some plantation owners hired Negroes for a season at a stipulated sum. If the Negroes worked extra days, they were paid at the rate of 20 cents per day; if they failed to work on a day that they should have, they were fined from 40 to 50 cents a day. All of these various practices were attempts to develop a dependable agricultural labor force that would work under freedom with some degree of efficiency.

In addition to a disorganized labor force, the destruction of capital itself was a powerful force retarding agricultural expansion. Livestock could only be replaced with the passing of time, and even had the labor force been efficient, fields could not give abundant yields with a shortage of mules, plows, and horses. Moreover, capital markets must have been highly imperfect right after the war. Planters and farmers probably could not borrow to replace their depleted stock, and the principal source of funds available to farmers undoubtedly came from internal sources. Since output was low, savings were low, and recovery retarded. The curse of the poor is their poverty!

Conditions in manufacturing after the war were more favorable for an expansion in

output. The predominantly white labor force was not utterly chaotic. The war's destruction created a strong replacement demand for almost all products. New homes and barns, new tools and wagons, new shoes and clothes were urgently needed. Moreover, anticipating some conclusions to be presented later, in spite of the drop in farm capacity, gross farm income experienced a sizable rise between 1866 and 1870. This rise in income allowed the needs of the people to be translated into effective demand and contributed to the rapid recovery in manufacturing.

The reports of manufacturing all testify to rapid rebuilding and expansion programs. The cities of Atlanta and Charleston had minor building booms. Victor S. Clark reported that during the session of 1865-1866, the Legislature of Georgia incorporated 17 manufacturing companies, "an evidence of a public interest in such enterprises that doubtless outran the possibilities of performance."¹¹

Within less than two years of the conclusion of hostilities, the mills at Columbus, Georgia, which had been burned during Wilson's raid, were under reconstruction. The mills at Saluda were rebuilt, and several mills were running in the Greenville district. A number of factories were established in central Alabama, Mississippi, and Texas. As early as 1868, the cotton mills of Augusta received special mention in the report of the Commissioners of the Paris Expositions as illustrating conditions favoring cotton manufacturing in the South.¹²

Southern railroads also recovered rapidly. In spite of Sherman's legendary destructiveness, the attrition through normal wear and tear, and the loss caused by the Confederate government pulling up railroad tracks to lay them elsewhere, one estimate indicates that the total railroad mileage in the South from 1860 to 1865 fell by only 32 miles.¹³ During the war, the Northern government operated captured Southern lines to move Federal

¹⁰ *Ibid.*, 219-220.

¹¹ Victor S. Clark, *History of Manufactures in the United States, 1607-1929* (3 vols., New York, 1929), 2: 148.

¹² *Ibid.*

¹³ John F. Stover, *The Railroads of the South* (Chapel Hill, North Carolina, 1955). In 1860 the total railroad mileage in the South was 9,167 (table, page 5). In 1865 the total railroad mileage in the South was 9,135 (table, page 61).

troops and supplies. In the process the government rebuilt and relaid miles of tracks. After the war, the Federal Government sold to Southern lines rolling stock on credit at less than the market price. During the 1870's, when the Southern railroads had difficulty in meeting their payments, Congress relieved them of their obligations. Promoters of both manufacturing establishments and railroads came north to borrow capital, and Northern financiers invested heavily, hastening the reconstruction of Southern railroads lines, mills, and factories.

James De Bow, the most prominent Southern economist of his day, traveled widely through the South during this period and gave, according to the historian, John Stover, a good account of the process of railroad restoration.

In 1866, he found the trains seldom running, accommodations terrible, and the rates twice as high as prewar. By 1867, the railroads were in as good a condition as before the war, with comparable schedules and rates only a quarter higher. He also noted that some companies were paying dividends and that many were meeting interest payments on time. . . . By 1870 the physical restoration and rehabilitation of southern railroads was practically complete.¹⁴

In summary, the war was a terribly destructive event for the South. It destroyed a large percentage of the South's capacity to produce agricultural products by decimating horses, cattle, and mules. But the war hit agriculture harder than it did manufacturing.

In the immediate postwar period, the labor force in manufacturing was not disorganized; the labor force in agriculture was disorganized. The postwar demand for manufactured products was great, and the rise in gross farm income enabled manufacturers to serve an expanding farm market. Therefore, conditions both during and immediately after the war were conducive to manufacturing capacity in the South expanding faster than agricultural capacity. As the data in Tables 1 and 2 reveal, manufacturing expanded from 1860 to 1870 while agriculture failed to recover its earlier position.¹⁵

What happened to agricultural output and farm income as a result of destruction of capacity and the disorganization of the labor force? Table 3 presents data on crop outputs derived from the estimates of the United States Department of Agriculture's Marketing Service and the United States Census. In every case the average output of crops in the South during the first five postwar years, 1866-1870, was considerably below the corresponding 1859 figure. Cotton was almost 50 per cent below its ante-bellum level of output, corn was 44 per cent lower, hay was down 64 per cent. In the rest of the country, output increased. Corn increased in the non-

¹⁴ *Ibid.*, 58.

¹⁵ It is interesting to note that manufacturing output recovered more quickly than agricultural output after both world wars of the twentieth century in most of the countries in Europe in which fighting took place.

TABLE 3
Average Output of Selected Crops in the South* and Non-South in 1859, 1866-1870 and 1876-1880

	Cotton (000,000 lbs)		Barley (000 bushels)	
	South	Non-South	South	Non-South
Output during 1859 †	2,373	-----	22	15,605
Average output during the five years 1866-1870	1,213	-----	121	24,574
Average output during the five years 1876-1880	2,395	-----	166	40,827
<i>Average output in ratio:</i>				
1866-70 to 1859	51.1	-----	55.1	157.5
1876-80 to 1866-70	197.5	-----	136.6	166.1
1876-80 to 1859	100.9	-----	75.4	261.6
	Tame Hay (000 tons)		Potatoes (000 bushels)	
	South	Non-South	South	Non-South
Output during 1859 †	1,045	18,038	6,600	104,500
Average output during the five years 1866-1870	386	22,489	4,969	111,840
Average output during the five years 1876-1880	817	30,316	7,158	147,696
<i>Average output in ratio:</i>				
1866-70 to 1859	36.9	124.7	75.3	107.0
1876-80 to 1866-70	211.9	134.8	144.1	132.1
1876-80 to 1859	78.2	168.1	108.4	133.6

TABLE 3—(Continued)

	Corn (000,000 bushels)		Oats (000,000 bushels)	
	South	Non-South	South	Non-South
Output during 1859 [†]	283	556	20	152
Average output during the five years 1866-1870	188	682	19	228
Average output during the five years 1876-1880	293	1,310	40	367
Average output in ratio:				
1866-70 to 1859	66.4	122.7	93.1	149.9
1876-80 to 1866-70	156.1	192.1	214.6	160.8
1876-80 to 1859	103.7	235.6	199.8	241.1
	Wheat (000,000 bushels)		Sweet Potatoes (000,000 bushels)	
Output during 1859 [†]	31	142	38	4
Average output during the five years 1866-1870	18	216	24	3
Average output during the five years 1876-1880	28	395	32	5
Average output in ratio:				
1866-70 to 1859	58.3	152.3	63.2	81.6
1876-80 to 1866-70	154.3	182.9	132.8	157.8
1876-80 to 1859	90.0	278.6	84.7	128.8
	Rye (000 bushels)		Buckwheat (000 bushels)	
Output during 1859 [†]	2,201	18,900	572	17,000
Average output during the five years 1866-1870	1,199	16,398	209	10,442
Average output during the five years 1876-1880	983	19,421	219	11,024
Average output in ratio:				
1866-70 to 1859	54.5	86.8	36.5	61.4
1876-80 to 1866-70	82.0	118.4	105.2	105.6
1876-80 to 1859	44.7	102.8	38.4	64.8
	Tobacco (000,000 lbs.)		Rice (000,000 bushels)	
Output during 1859 [†]	204	231	7	—
Average output during the five years 1866-1870	89	205	2	—
Average output during the five years 1876-1880	133	364	3	—
Average output in ratio:				
1866-70 to 1859	43.8	89.0	34.3	—
1876-80 to 1866-70	149.0	177.4	144.8	—
1876-80 to 1859	65.2	157.8	49.7	—
	Sugar Cane (000 short tons)			
Output during 1859 [†]	116	—		
Average output during the five years 1866-1870	42	—		
Average output during the five years 1876-1880	107	—		
Average output in ratio:				
1866-70 to 1859	36.6	—		
1876-80 to 1866-70	253.3	—		
1876-80 to 1859	42.6	—		

* South defined as the 11 states that seceded from the Union.

† United States Census.

Sources:

The output figures for each of the crops were derived from the following:

"Cotton and Cottonseed," USDA, Agricultural Marketing Service, June 1955, Statistical Bulletin No. 164.

"Revised Estimates of Barley Acreage, Yield, and Production, 1866-1929," USDA, Bureau of Agricultural Economics, February 1955 (mimeographed).

"Revised Estimates of Tame Hay Acreage, Yield, and Production, 1866-1929," USDA, Bureau of Agricultural Economics, December 1934 (mimeographed).

"Potatoes, 1866-1950," USDA, Bureau of Agricultural Economics, March 1953, Statistical Bulletin No. 122.

"Corn by States, 1866-1943," USDA, Agricultural Marketing Service, June 1954.

"Oats by States, 1866-1943," USDA, Agricultural Marketing Service, June 1954.

"Wheat, Acreage, Yield, Production, by States, 1866-1943," USDA, Agricultural Marketing Section, February 1955, Statistical Bulletin No. 158.

"Revised Estimates of Sweet Potatoes, Acreage, Yield per Acre, and Production, 1868-1923," USDA, Bureau of Agricultural Economics, February 1937 (mimeographed).

"Revised Estimates of Rye Acreage, Yield per Acre, and Production, 1866-1929," USDA, Bureau of Agricultural Economics, October 1935 (mimeographed).

"Revised Estimates of Buckwheat Acreage, Yield per Acre, and Production, 1866-1929," USDA, Bureau of Agricultural Economics, August 1936 (mimeographed).

"Tobacco of the United States," USDA, Bureau of Agricultural Economics, July 1948.

"Gross Farm Income and Indices of Farm Production and Prices in the U.S., 1869-1937," by Frederick Strauss and Louis H. Bean, USDA, December 1940, Technical Bulletin No. 703; and the "New Orleans Price Current, Commercial Intelligence, and Merchants' Transcript," August 31, 1870; annual report.

South by 22 per cent, wheat by 52 per cent and hay by 24 per cent. These output figures conform to the resource figures presented earlier. In both instances the Southern series in the immediate postwar period fell below the corresponding 1860 levels; in both cases the non-South figures rise above the corresponding prewar figures.

Fifteen years after the war, the output of the South's major crops had expanded rapidly. The average cotton output during the five crop years, 1876-1880, was almost twice as high as the average output during the years 1866-1870. The average corn output was 56 per cent higher, wheat output was 54 per cent higher, and hay output was 111 per cent higher. In the rest of the country, agricultural output also expanded during these 15 years. In some cases, like hay, potatoes, and oats, the South grew at a faster rate than the non-South; in other cases, like barley, corn, and wheat, the South grew at a slower rate.

The data in Table 3 also show a growth of output over that in 1860. By 1880 the output of the two most important Southern crops, corn and cotton, and the output of two minor crops, potatoes and oats, exceeded their prewar level. Other crops, like wheat and sweet potatoes, closely approximated their prewar level, while still others lagged behind. All of the non-South series in 1880, however, were substantially above their prewar level. These results also roughly conform to the resource figures presented earlier in the chapter.

Considering only the two most important crops of the South, cotton and corn, agricultural production recovered to its prewar level in a little less than 15 years. By 1880 the South's output of these crops was slightly higher than in 1860. However, the agricultural output of the non-South continuously expanded throughout this 20 year period. Consequently, the South fell relative to the rest of the country.

Since farm prices fluctuated, the gross farm

TABLE 4
Gross Southern Farm Income from Selected Crops*
(in millions of dollars)

	Cotton	Tobacco ^b	Sweet Potatoes ^c	Wheat ^d	Potatoes	Corn ^e	Oats ^f	Hay ^g	Rye	Cane Sugar	Rice	Total	1859 = 100
1859 ^h	277.6	21.4	36.0	33.0	2.8	166.7	7.8	7.5	1.6	18.9	2.2	575.5	100.0
1866	337.1	11.2	(20) ^g	22.4	2.3	79.5	7.9	2.1	.9	5.3	(1) ^g	489.7	85.1
1867	245.0	9.8	(20) ^g	35.4	2.4	164.2	10.0	4.3	1.7	5.8	(1) ^g	499.6	86.8
1868	236.0	12.0	44.2	32.2	3.9	183.7	11.6	4.1	1.7	11.6	(2) ^g	543.0	94.4
1869	310.6	8.3	21.3	25.6	2.4	125.2	12.0	5.5	1.4	11.9	2.8	527.0	91.6
1870	338.8	11.9	25.5	20.8	3.4	162.1	10.4	5.5	1.1	20.5	2.4	602.4	104.7
1871	231.8	9.2	20.6	19.6	4.1	115.0	8.9	7.0	.8	16.9	1.7	435.6	75.7
1872	352.8	12.1	19.2	31.5	3.4	107.6	8.7	7.5	.9	13.8	2.2	559.7	97.3
1873	320.8	11.0	24.4	24.9	4.4	98.1	11.1	7.8	.7	10.3	2.5	516.0	89.7
1874	254.9	8.2	20.4	29.7	4.1	151.7	12.6	7.2	.9	13.0	2.9	505.6	87.9
1875	279.6	14.9	22.4	31.8	3.8	192.2	16.3	7.4	.9	15.7	3.3	588.3	102.2
1876	225.4	7.3	20.4	28.2	3.2	195.6	12.8	7.5	.8	18.6	3.2	473.0	82.2
1877	240.6	10.0	17.8	42.4	4.8	143.4	13.5	6.7	.9	15.0	2.8	497.9	86.5
1878	219.4	7.4	19.7	24.1	3.6	132.0	12.0	7.0	.5	20.6	2.7	449.0	78.0
1879	278.6	8.3	16.6	25.7	4.0	115.3	13.6	5.9	.5	13.2	3.3	485.0	84.3
1880	351.4	9.5	18.2	24.8	3.2	150.0	13.0	9.5	.7	23.5	4.4	608.2	105.7

* Gross farm income is the product of farm output times unit prices. Gross farm output in the South was taken from the sources of Table 3. The farm prices per unit of output from 1869 through 1880, were taken from Frederick Straus and Louis H. Bean, "Gross Farm Income and Indices of Farm Production and Prices in the United States, 1869-1937," USDA, Technical Bulletin, No. 703, Washington, Government Printing Office, 1940. Before 1869 farm prices per unit were computed as follows: An annual index of each crop's price was constructed from Anne Bezanon's "Wholesale Prices in Philadelphia, 1857-1896" (Philadelphia, 1954). In these series, 1869 was used as the base. This base figure was then adjusted to fit Straus and Bean's figure of the farm price per unit in 1869, and the annual prices during each of the preceding years accordingly.

^b The price of tobacco prior to 1869 was taken as equal to the New Orleans price of tobacco leaf, quality, good to fair. For the year 1859, I reduced the 1860 price of tobacco by 55 per cent, since Bezanon reports this was the behavior of Kentucky tobacco.

^c The price of sweet potatoes was assumed to behave like the price of white potatoes. The data on the movements of white potatoes were taken from the "Aldrich Report," Part 2, p. 119.

^d The price of wheat refers to Bezanon's red wheat price, "Wholesale Prices," p. 504.

^e No deductions were allowed in the output of corn, oats, and hay for feed. By using the entire value of these crops, we approximate the cost of production of feeding cattle and livestock and the gross income received from cattle. Consequently, figures presented of gross farm income from crops includes some of the gross farm income received from cattle. These series then overstate the return from crops alone, but understate the return from both crops and livestock. These deficiencies would be serious if an analysis were to be made of the level of farm income. They are less serious, however, for indicating the direction of change, in farm income and the greater part of the discussion in the text is along this line.

^f United States Census.

^g These figures are arbitrary. They are based upon an interpretation of contemporary newspaper stories.

income of Southerners—the product of output times unit prices—behaved differently from Southern farm output alone. If the prices and output series move at different rates of speed or in opposite direction, the income and output series will also move by different amounts or even in opposite directions. Farm output, for example, fell drastically immediately after the war, but farm prices were considerably above their prewar level. Consequently, gross Southern farm income from crops in current dollars reported in Table 4 did not fall after the war by as much as output. In 1866 crop outputs were from 30 to 50 per cent below their prewar level; gross farm income, however, was only 15 per cent below its prewar level.

Between 1866 and 1870 gross farm income from crops rose and in 1870 exceeded its 1859 level. The following year, 1871, was marked by a severe drop in cotton output. The price of cotton, low during the first five months of 1871, rose by almost 50 per cent during the second half of the year. Even this sharp price rise, however, was not enough to compensate

for the drop in output, and gross farm income fell. Several of the New Orleans factoring houses that made loans to planters on standing crops found that they had advanced more to planters than the value of their crops. Many of these factors were driven to the wall,¹⁶ and planters as well as businessmen found themselves hard pressed to meet their obligations. In the South, gross farm income during 1871 was lower than during any other postwar year investigated. Not until 1878, the trough year of the longest depression in American history, did gross farm income approach the low figure reached in 1871.

Over the 15 years following the Civil War, gross farm income averaged only 90 per cent of its 1859 level. In only three post-war years, 1870, 1875, and 1880, did gross income exceed its prewar level. In spite of the rise in output over this period, the predominantly downward movement of prices prevented a pronounced upward trend in income.

¹⁶ *The New Orleans Price Current, Commercial Intelligencer and Merchants Transcript*, August 31, 1872.

RUNNING A "DAIRY" IN CHINA

In Foochow, China, a city as large as St. Louis, the few who would have pure milk are supplied by a walking dairy. The milkman leads his cow to the front door of his customer's house, and there, in his customer's presence, milks the required measure. The ordinary customer takes no more than about a third of a pint.

After one is supplied the cow man leads his cow and calf to the front door of the next customer and thus passes on until all customers are supplied, or his walking dairy's limited supply is exhausted. There are probably no more than half a dozen such "dairies" in Foochow.

—From the *Prairie Farmer* (1910)

CHEAP AND GOOD BREAD

Is to be furnished the citizens of Chicago hereafter. On the west side on Clinton Street, between Randolph and Lake, is a large building of five stories, 65 feet front by 75 feet deep, known as the "Chicago Mechanical Bakery," where an incredible quantity of bread and crackers is manufactured in double quick time. The work is *all* done by machinery in the same manner as performed at the bakery in Brooklyn. The opening of this immense manufactory took place July 1st, and it is expected to change the character of the bread trade in the city. We allude to it more with the purpose of calling the attention of our country readers to the fact that, it is always to be open to visitors who can watch the whole process of bread making as performed by this automatic baker.

From *Journal of Agriculture* (1853)

Changes in Corn Production on the Northern Margin of the Corn Belt

HOWARD G. ROEPKE

Since the 1930's an almost complete change has been brought about in the type of corn grown commercially in the United States. In 1930, all the corn planted, except for experimental fields, was of the open-pollinated variety. At present, more than 90 per cent of the corn planted is hybrid seed of one sort or another. The early adoption was rather slow and confined to limited areas, so in order to illustrate the changes after it ceased to be a novelty this paper deals with the period from 1940, when less than one-third of United States corn was hybrid, to 1954, when nearly 90 per cent of the corn in the United States and 97 per cent of that grown in the North Central states was of hybrid varieties.¹

Probably the most important consequence of hybridization is the increase in yield it has made possible (estimated at 20 per cent on a national basis),² but other desirable characteristics have also been obtained. Much of the efficiency of mechanical corn pickers, for example, is due to the breeding of corn varieties with improved standability.

The characteristic of hybrid corn with which this paper is concerned is rapid maturity and its consequences. Most of the old open-pollinated varieties took 140 days or longer to mature. Through hybridization, varieties have been developed which mature in as little as 90 days—although at some sacrifice in yield. (In passing it may be noted that some breeding has aimed at the opposite result—slower maturity in order to take maximum advantage of the long growing season in some areas.) The quick-maturing hybrids make it possible to grow corn for grain in areas where the short growing season formerly made this impossible.

There has been much speculation as to the effect of hybrids on the areal extent of corn production, and there have been tentative statements that the corn-growing area and perhaps even the Corn Belt³ was being extended northward. Two types of areas might be expected to show agricultural change if there had been an extension of the corn-grow-

ing area; first, those areas which were formerly marginal for the growing of corn for grain but which can now count on maturing the crop each year; second, those areas where, because of the short growing season, little or no corn was formerly grown but which have now become at least marginal for corn. Any northward extension of the complex, multi-factor region known as the Corn Belt would have to be revealed by coincident changes in other characteristics—livestock production, for example—and not by corn production alone.

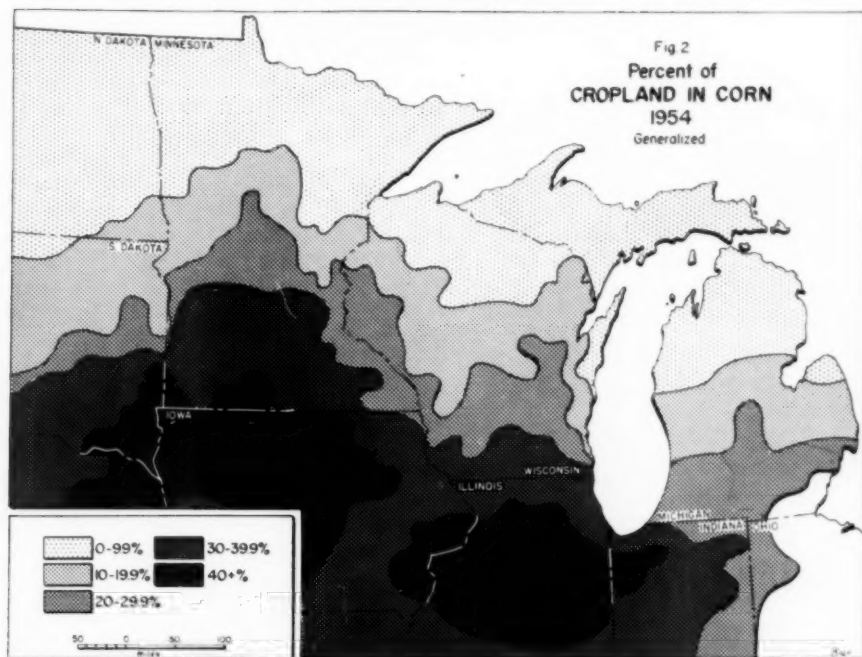
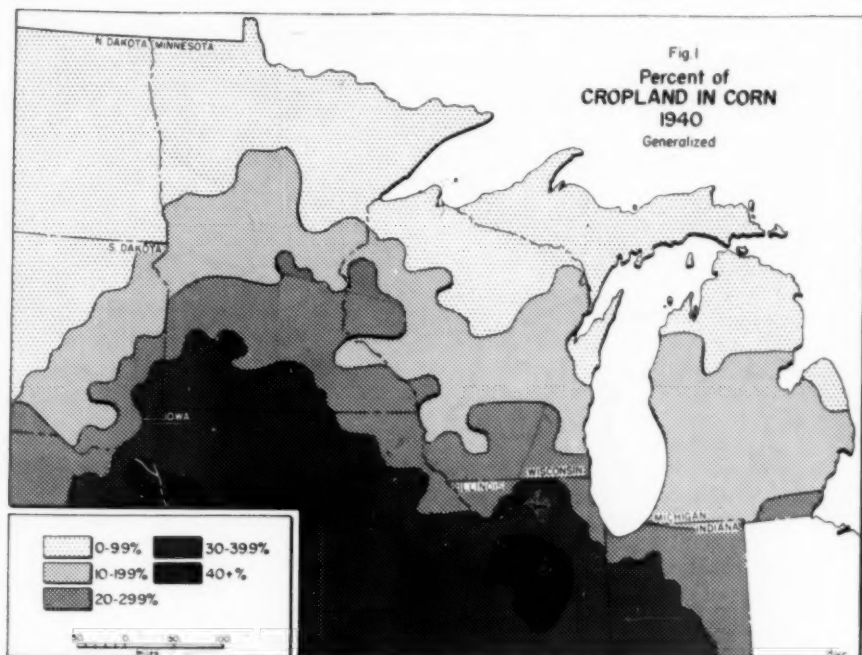
The first set of maps⁴ (Figs. 1 & 2) shows a change which has taken place within the heart of the corn-growing area as well as on its northern margin. Throughout the whole area there has been a general increase in the proportion of cropland planted in corn. In 1940 only three small areas had more than 40 per cent of their cropland in corn, while in 1954 these had expanded into two large sections covering much of the heart of the corn-growing area. In these areas of corn dominance the increased intensity of corn growing is probably not directly related to the introduction of hybrids, but rather reflects the decreasing number of work animals which has freed for corn land formerly devoted to the cultivation of oats for animal feed. Fig. 3, which shows the northern boundaries of the regions of various intensities for the two years, better illustrates these changes on the northern margin of the corn-growing area. On this northern margin the percent change in crop land planted in corn was even greater

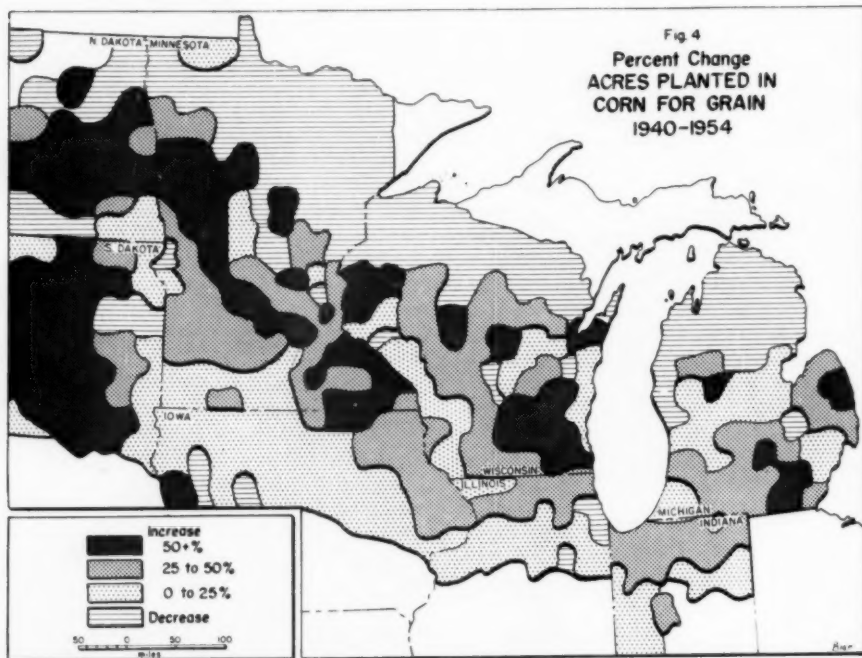
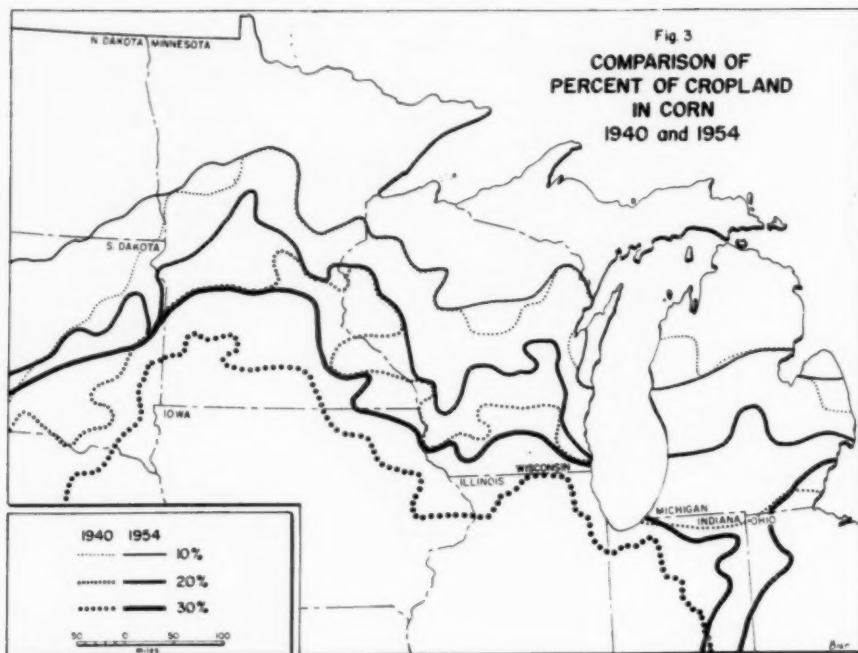
¹ U. S. Department of Agriculture, *Agricultural Statistics, 1955* (Washington: Government Printing Office, 1956), 31.

² A. P. Grotewold, "Regional Changes in Corn Production in the United States from 1909 to 1949," Univ. of Chicago, Dept. of Geography, *Research Paper No. 40* (Chicago, 1955), 19.

³ For a discussion of the general adoption of this term see: William Warntz, "An Historical Consideration of the Terms 'Corn' and 'Corn Belt' in the United States," *Agricultural History*, 31 (no. 1): 40-45 (January, 1957).

⁴ Data used in compiling all the maps were taken from the 1954 *Census of Agriculture*.





than in the heart of the corn-growing area and undoubtedly reflects at least in part the availability of quicker-maturing hybrid corn. In areas formerly marginal for corn growing the boundaries have been displaced considerably northward. This is particularly apparent in the 20 per cent and 30 per cent lines and has occurred in Minnesota, Wisconsin, and Michigan. In contrast, the 10 per cent line has shifted very little in these states during the 1940-54 period. From this measure, then, it is indicated that there has been a considerable change in the intensity of corn growing in the areas formerly marginal for corn but relatively little change in areas where corn maturing has now become a marginal possibility.

Another method of discovering the areas in which the greatest change in corn growing has occurred is to examine directly the changes in the amount of land planted in corn. Since we are interested here particularly in the possibility of maturing corn, that planted for grain is probably the best indicator. Fig. 4 shows the per cent of change in the acreage planted to corn for grain between 1940 and 1954. Several things are apparent from this map. First, nearly the whole formerly-marginal area shows a marked increase in the acreage planted to corn for grain. Second, especially large increases—those amounting to 25 per cent or more—occur in Minnesota, Wisconsin, and Michigan in approximately the same areas which showed the greatest change on the previous maps. Third, there has been an actual decrease in the acreage of corn for grain in the northern parts of these states in the area presumably newly marginal for corn.

Much of the area shown on Fig. 4 as having less corn planted for grain in 1954 than in 1940 has an average frost-free period of about 120 days—which is very near the minimum for 90-day corn with the present imperfect weather forecasting techniques. While small amounts of corn were actually involved, it is interesting to speculate as to what kind of optimism led to the planting of corn for grain with the varieties available in 1940.

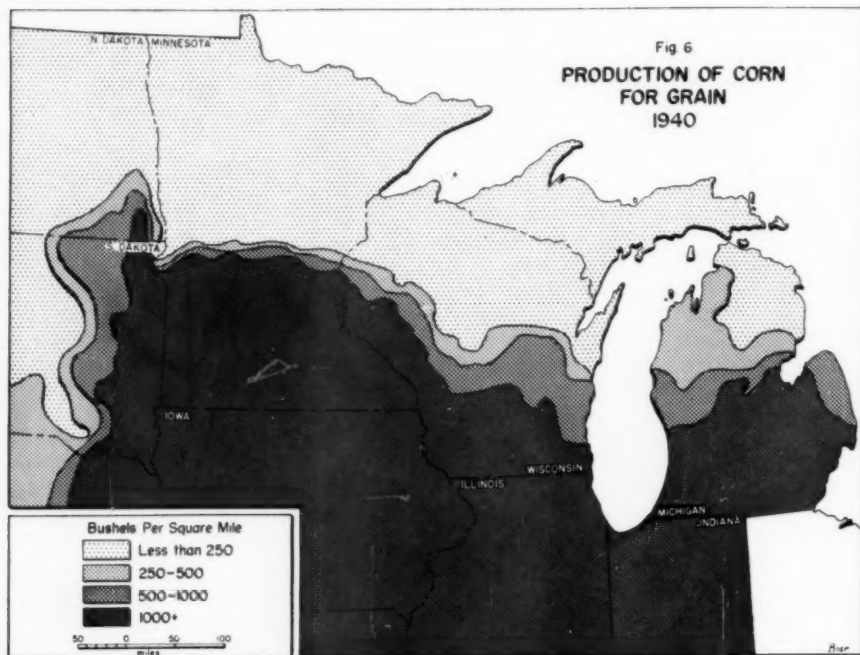
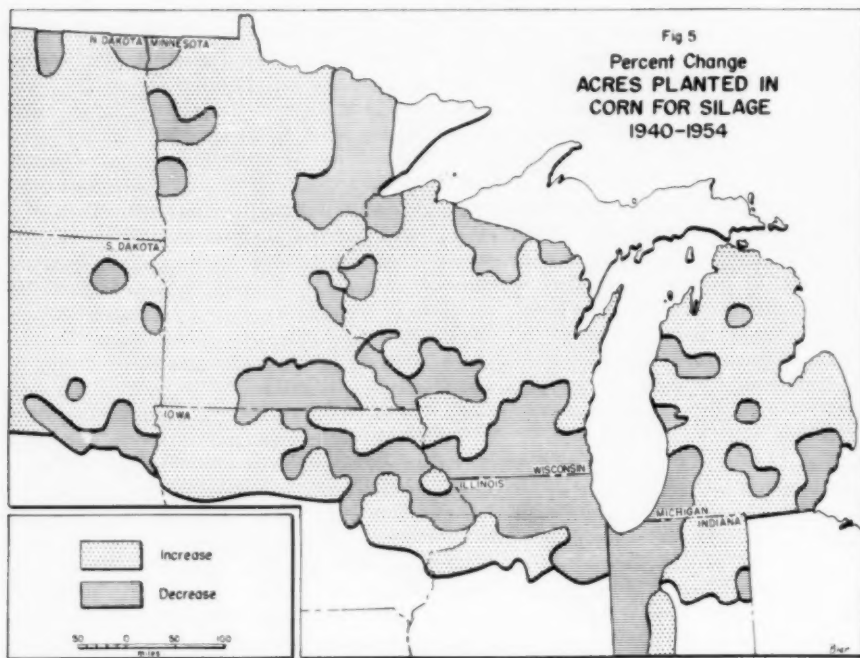
A much more widespread pattern of increase is shown on Fig. 5 which illustrates the change from 1940-1954 in the acreage of corn planted for silage. Some of the areas in Min-

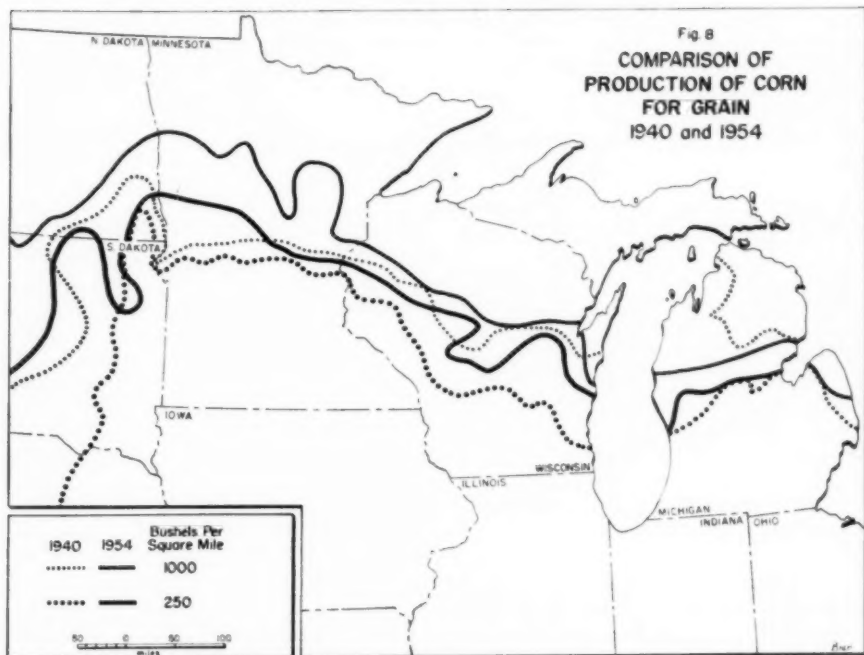
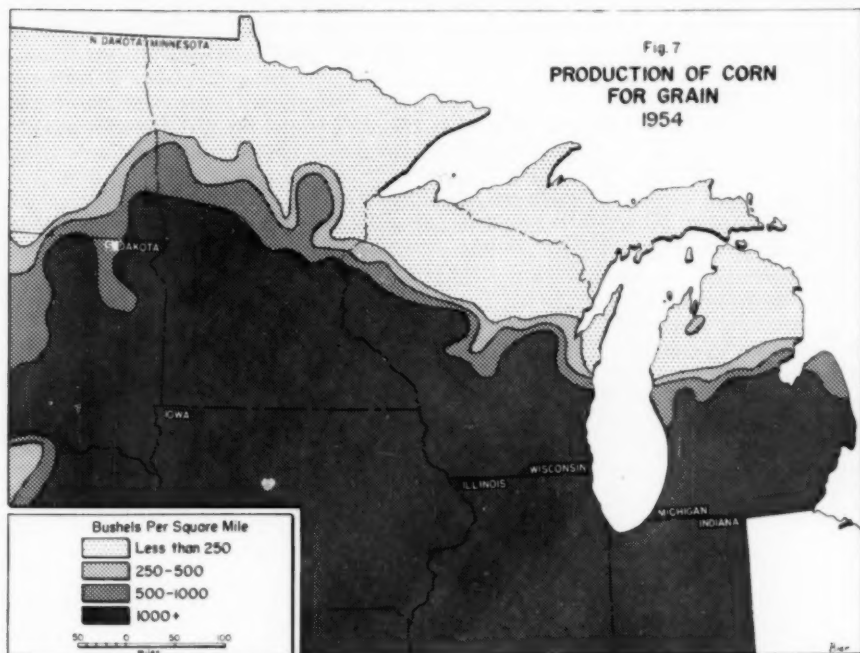
nesota, Wisconsin, and Michigan which showed the greatest increase in corn for grain show decreases in corn for silage. This probably reflects the increased certainty of maturing the crop resulting from the use of hybrids. It should particularly be noted that the sizable areas of decrease in the southern portion of this map lie within the areas which were marginal for corn in 1940.

Changes in the actual production of corn are shown on the next series of maps. The measure of bushels per square mile was chosen because it probably best reflects the actual intensity of production by including the effect of variations in proportion of land in farms and in crops, differences in yield, etc. For whatever reasons, this is the production which has been attained. Fig. 6, showing production in 1940, illustrates the rapidity with which corn production decreased to the northward of the main producing area. (If the isopleths for quantities greater than 1000 bushels per square mile were shown, the close spacing would continue southward to a peak of 12 to 13 thousand in northern Illinois and central Iowa.) The major exception to the rapid decrease northward was in Western Michigan where the rate of change was less rapid. By 1954 (Fig. 7) this anomaly was no longer present. In 1954 the isopleths in Minnesota and Wisconsin had moved northward from their 1940 positions and showed a less rapid rate of decrease from the central area of high production. In Michigan the 1000 bushels per square mile line was in almost exactly the same position in 1954 as in 1940, while the isopleths of lower value were actually well south of their 1940 positions. The positions of the isopleths in the two years are compared in Fig. 8. Incidentally, the 1000 bushels per square mile line corresponds quite closely with the line of 4 bushels of corn per acre of farmland used by the United States Department of Agriculture as one of the criteria for the margin of the "commercial corn producing area" in establishing acreage allotments under the price support program.⁵

If space permitted, a similar series of maps could be shown to illustrate changes in the several factors which together may be used to

⁵ The U.S.D.A., of course, uses a 10-year average production figure and includes the criterion of an average production in a county of 450 bu. or more per farm.





define the Corn Belt. A summary of the results, however, must suffice. The patterns of change are much less clear than those already shown for corn production. Employing the multi-factor criteria suggested by de Laubenfels,⁶ it is possible to find only one area which seems now to be acquiring true Corn Belt characteristics. This is the district in southern Wisconsin which showed up on earlier maps so conspicuously as increasing the amount of land devoted to corn for grain and decreasing the land devoted to corn for silage. Here there seems to be a shift from dairying to the Corn Belt crop-livestock system. It is quite certain, however, that the change in this area cannot be wholly ascribed to the impact of hybrid corn.

A more general note of caution should also be sounded here. This analysis has described changes probably attributable to the use of

hybrid corn, but it by no means follows that these changes were the inevitable result of the introduction of the new varieties. The areal impact of these genetic improvements might have been quite different had the adoption of hybrids come under different market situations than have actually prevailed.

The introduction of quick-maturing and reliable varieties of hybrid corn, then, may be suggested to have had the following results: (1) a significant increase in grain corn production in areas formerly marginal for corn; (2) no significant extension into newly marginal areas; and (3) perhaps some part in the extension of the Corn Belt crop-livestock system into certain areas of southern Wisconsin.

⁶In a paper read at the annual meetings of the Association of American Geographers in 1955. The paper is now being prepared for publication.

NO COLORING IN OLEO

The United States Supreme Court says that Congressman William J. Moxley, of Cook county, millionaire manufacturer of butterine, recently fined \$29,000 for fraudulently coloring butterine, cannot recover the amount of his fine.

Moxley used palm oil in making butterine because it colored the product artificially to resemble butter. He tried to convince the Supreme Court that the use of palm oil was necessary to make butterine, and that the coloring was an incident.

Unquestionably the finding of the Supreme Court was sound and dairymen are to be congratulated upon one more victory in the interests of honest butter.

Is Moxley now to answer to the counts for defrauding the government in vending "moonshine" butter?

—From the *Prairie Farmer* (1910)

RAILWAYS AND THE FARMER

Each year witnesses closer relationships between the railways and the farmer. This intimacy is due to the awakening on the part of the railways to the fact that the success of the farmers along their lines measures to a large extent the traffic their roads will handle, thereby directly affecting the system's dividends and its strength in the market places.

"You are carrying coals to Newcastle," was what the skeptic told the railroads a few years ago when they first began to interest themselves in the success of agriculture along its lines.

The skeptic now sees his mistake. Whenever the railway has gone half way the farmer has not hesitated to meet it. The result is that along the railway that has interested itself in agriculture, the farmers are responding and the tonnage of the railway is increasing.

The explanation is simple. The more the farmer raises the more he can buy, and both contribute to creating business for the railway.

—From the *Prairie Farmer* (1910)

Henry George Reexamined: William S. Chapman's Views on Land Speculation in Nineteenth Century California

GERALD D. NASH

Not quite a century ago Henry George wrote *Progress and Poverty*, one of the most successful tracts in the history of American reform movements. Many of the general conclusions of this work were based on his own personal experiences as a newspaperman and journalist in California.¹ In fact, eight years before the publication of his most notable book, George foreshadowed it with a briefer one—a searing criticism of land monopoly in California.² For, in 1871, land ownership in the State was concentrated in the hands of a few individuals who controlled tracts aggregating millions of acres. What George failed to realize, however, was that California was undergoing a transition from virgin frontier to a more intensive, small farm agriculture, a temporary cycle in land ownership which had already advanced further in the older Middle Western states. Like many late nineteenth century reformers, George relied more on the pent-up anger of his emotions than on a sober, rational analysis of the land situation in California.

George blamed large-scale speculators for the concentration of land ownership in California. As he stated forcefully in his early book:

In all of the new States of the Union land monopolization has gone on at an alarming rate, but in none of them as fast as in California. . . . These lands were gobbled up by a few large speculators, by the hundred thousand acres. . . . Millions of acres have been monopolized by a handful [sic] of men. . . . The chief of these speculators [Chapman] now holds some 350,000 acres. The State has been made the cat's paw of speculators.³

Such an indictment was not entirely unjustified since in many areas of the United States the baneful effects of speculation had already been recognized. Detailed studies of land disposal in Indiana and Illinois have shown for example, that speculation led to an overly rapid dispersion of the population, with attendant social evils, and to uneconomic land utilization.⁴ But while these conditions also existed in California, they

could not be blamed simply on the speculators. Indeed, the leading land dealer in the state, William S. Chapman, was himself cognizant of the situation and tried earnestly to overcome it.

For a decade after 1865 Chapman was one of the largest land owners in California, if not in the entire United States. Emigrating from Minnesota in the early 1860s, he was among the first to see that fortunes in the new state were to be made in land, not gold. His large purchases from Federal and State land offices were begun in 1864 and increased with the decade as he collaborated with Isaac Friedlaender, the biggest wheat grower and shipper in the state, and the acknowledged "Wheat King" of California. By 1871 Chapman owned more than one million acres, most of it bought from the Federal government. When plotted on a land-use map his holdings comprised some of the best areas in the state.⁵

¹ Charles A. Barker, *Henry George* (New York, 1955), 72–195.

² Henry George, *Our Land and Land Policy—National and State* (San Francisco, 1871); *Progress and Poverty* (Fiftieth Anniversary Edition, New York, 1929), 224, 276–77, 436–37.

³ George, *Land and Land Policy*, 13, 19, 22, 23, 26.

⁴ See studies of Paul W. Gates, "The Disposal of the Public Domain in Illinois, 1848–1856," *Journal of Economic and Business History*, 3: 234–237 (February, 1931); "Land Policy and Tenure in Indiana," *Indiana Magazine of History*, 35: 25–29 (March, 1939); "The Role of the Land Speculator in Western Development," *Pennsylvania Magazine of History and Biography*, 64: 330–333 (July, 1942); Ray A. Billington, "The Origin of the Land Speculator as a Frontier Type," *Agricultural History*, 19: 211; but see Thomas Le Duc, "State Disposal of Agricultural Scrip," *Agricultural History*, 28: 106 (July, 1954), and Allan and Margaret Bogue, "Profits and the Frontier Land Speculator," *Journal of Economic History*, 17: 1–24 (March, 1957).

⁵ See Chapman's testimony in "Testimony before the Joint Committees on Swamp and Overbowed Lands and Land Monopoly," in *Appendices to the Journals of the Legislature of the State of California*, 20 Sess. (Sacramento, 1874), 5: 35, 39, 85; *San Francisco Chronicle*, March 17, 1906; Lilbourne A. Winchell, *A History of Fresno County and the San Joaquin Valley* (Fresno, 1933), 102–05; Paul W. Gates, "The Homestead Act in an Incongruous Land System," *American Historical Review*, 41: 669 (July, 1936), and also his book, *The Wisconsin Pine Lands of Cornell University* (Ithaca, 1943): 31–32.

The glaring deficiencies of Federal and State land laws made Chapman's existence as a speculator all but necessary. Such basic statutes as the Preemption and Homestead Acts, as well as California's Green Law of 1868, ignored the realities of geographical conditions by making no provision for land classification; this easily led to uneconomic land utilization. Cultivation of one hundred and sixty acre homesteads may have suited conditions in the Middle Western states but proved unworkable in most regions of California. A large portion of the San Joaquin Valley in 1860, for example, could be utilized only for grazing or wheat farming. Since large tracts were required for these agricultural pursuits, the land laws impeded the sale of lands in the Valley, which was mostly unoccupied from 1853 to 1865. Nor did the public land system promote the establishment of dense settlements. Newcomers to the state, unacquainted with its terrain, could get little guidance from public authorities. Moreover, the two-season climate proved especially puzzling to the Middle Western farmers who found it difficult to adapt to new crops and new modes of cultivation. Yet no help was forthcoming from State and Federal land offices to help them in the adjustment to their new environment.

The vacuum left by such weaknesses in the governmental land system stimulated Chapman to act. Aware that ownership of land by the few was fostering a widely scattered population, he sought to bring about greater concentration by fostering colonies of small settlers. Certainly he did much, too, to foster better land utilization by publicizing the most desirable locations for new farmers and acquainting them with new techniques of agricultural production. Thus he conducted crop experiments on his own farms and pioneered in the development of irrigation. Chapman's motives were not altruistic for he hoped that close settlement would raise the value of his lands.⁶

Certainly the sparsity of rural population in California about 1871 could not be laid simply at the door of speculators, as Henry George charged. The prices at which Chapman sold to bona fide settlers generally were not exorbitant while the parcels were of such size as to be economically remunerative. In

1868, for example, an 80,000 acre plot was sold to a colony of German farmers, who settled in Fresno County between the Fresno and King Rivers, at an average price of \$1.80 per acre. After improvement, just a decade later, the value of these lands had increased six-fold.⁷

Chapman also made positive efforts to people his vast domains with small farmers. By 1871 the problems generated by concentration of land ownership were widely recognized and attempts were made to overcome them. One effective solution, it was thought, would be the promotion of communities of farmers whose problems of securing capital and of utilizing agricultural techniques suited to California would be solved by union in a colony.⁸ Chapman took the initiative in this new movement by underwriting in 1875 the first such colony—the Central Colony. As a businessman he hoped that this venture would raise the value of his neighboring properties. Thus he donated 192 tracts of 20 acres each to the Colony. The plans called for the farmers to grow alfalfa to provide a basis for a cattle industry. Since the possibilities of fruit raising were only beginning to be talked about during this period, Chapman sent an agent to Spain to select the best varieties of muscatel. Of these he imported thousands of cuttings for the use of the settlers in the community. During the first critical years of its existence, he repeatedly extended financial aid to individual settlers, although eventually he was to become embroiled with them in a dispute over water rights.⁹

Chapman pioneered, too, in experiments designed to determine conditions for the most advantageous use of land in California. Few had Chapman's foresight in the 1860s to visualize the agricultural possibilities of desert and grazing lands. On his own

⁶ Ben R. Walker, *The Fresno County Blue Book* (Fresno, 1941), 152.

⁷ George, *Land and Land Policy*, 25; Winchell, *History of Fresno County*, 104-05, 139.

⁸ Virginia Thickens, "Pioneer Agricultural Colonies of Fresno County," *California Historical Society Quarterly*, 25: 17-38.

⁹ Winchell, *History of Fresno County*, 135-38; Walker, *Fresno County Blue Book*, 43, 98; Thickens, "Pioneer Agricultural Colonies of Fresno County," *California Historical Society Quarterly*, 25: 17; *Fresno Expositor*, December 8, 15, 1875.

ranch, "Chowchilla," in Fresno County, he was among the first to plant alfalfa extensively for beef cattle. He was among the first, also, to recognize the feasibility of converting "desert" lands into profitable wheat growing acres.¹⁰

As a matter of fact it was his interest in wheat growing which led him to become one of the initiators of the organized irrigation movement in California. There had been flumes and irrigation ditches since the early days of the Gold Rush but it was not until the late sixties that serious consideration was given to the advantages of commercial irrigation. As early as 1871 Chapman was among the founders of one of the earliest irrigation companies, the Fresno Canal and Irrigation Company, which supplied water mainly to his own lands. More important, in terms of state-wide significance, was his participation in the founding of the San Joaquin & Kings River Canal and Irrigation Company, the largest such project in nineteenth-century California. This enterprise, fathered by Chapman, Friedlaender, Charles Lux, and William C. Ralston of the Bank of California, sought to bring water to the arid lands of the great San Joaquin and Sacramento Valleys in California through an elaborate system of canals. Daring in conception and design, it was in some ways a precursor of the controversial Central Valley Project in contemporary California.¹¹

It was partly the expense of this vast undertaking which brought about Chapman's financial ruin. After 1875 he lost most of his lands to the Bank of California, to Miller and Lux, and to the Scottish capitalists who had given him backing. Though continuing his activities in real estate until the end of the century, henceforth his role in

the development of the state was minor.¹²

Yet at the height of his career, he had made some significant contributions to its growth. An entrepreneur in the broadest sense of the word, he had filled a void created by the many imperfections in the systems of land distribution devised by the State and Federal governments. Although the value of his varied activities might be questioned, it cannot be denied that as a middleman he performed some very necessary functions.

The following document,¹³ a letter by Chapman explaining and defending his actions as a land speculator in response to attacks made upon him, has a two-fold significance. In the first place it casts doubt on one of the basic assumptions from which Henry George elaborated his general views on political economy—the role of speculation in concentration of land ownership. In addition, it clarifies the role which middlemen played in the distribution of the public lands in California. Thus it serves as a case study for that more general appraisal of the land speculator's role in American history which can be made only after more evidence has been accumulated.

¹⁰ Winchell, *History of Fresno County*, 11; Walker, *Fresno County Blue Book*, 102.

¹¹ San Joaquin & Kings River Canal and Irrigation Company, *Prospectus* (San Francisco, 1873), and *Report*, 1873 (San Francisco, 1873), 13; Winchell, *History of Fresno County*, 106, 110; Paul E. Vantor, *History of Fresno County* (2 vols., Los Angeles, 1919), 1: 179–80; see also Mary Montgomery and Marion Clawson, *History of Legislation and Policy Formation of the Central Valley Project* (Berkeley, 1946), 3–4; Moses J. Church, "Irrigation in California," mss. in Bancroft Library, University of California.

¹² San Francisco *Call*, May 13, 1887; San Francisco *Directory*, 1881–1906; Edward P. Treadwell, *The Cattle King* (Rev. ed., Boston, 1951), 66–68, 72–73.

¹³ San Francisco *Evening Bulletin*, August 31, 1868.

San Francisco,
August 27, 1868

Editor *Bulletin*. I have noticed several articles in your paper relative to the late entries of large amounts of public land in this State by individuals, which seem to me calculated to mislead. Presuming that your errors are not intentional I venture to correct some of them.

Both the *Bulletin* and *Times* err in assuming that "speculators" have taken, are taking, or can take up such immense tracts of land in California as not to have room for preemptors. They err, also, in believing that any *bona fide* preemptors leave this State because "speculators" have left them no good locations.

The fact is patent to every man who takes

the trouble to examine the township plats in the United States Land Office, or uses his eyes or ears while travelling over the State, that there are now millions of acres of good land (much of it surveyed, but much more unsurveyed) open to settlement by the *bona fide* preemptor.

The agricultural land which has lately been entered by "speculators" is land mostly in the San Joaquin Valley, which has been open to entry by preemptors and others at *one dollar and a quarter per acre in greenbacks*. "Actual settlers" have passed these lands by with contempt for years before they were offered at public sale by Buchanan's administration, in 1859, and ever since that time any man who chose could obtain any portion of these lands by paying the price above named. They afforded no revenue to the United States Government; they did not aid the county or State, for they could not be taxed, being the property of the United States; they were thought to be worthless, for they were during the dry season an apparently barren, worthless plain, without trees, and without water except it was obtained by digging or boring.

I examined these lands and satisfied myself that they were very valuable for wheat raising, but that there had been a fundamental error in the mode of cultivation. I thought where such grass would grow as there grew in winter and withered in summer, wheat would grow. But I thought the wheat ought to have the same time to grow as the grass; that it ought to be sowed just before or at the very commencement of the wet season, that it might grow stout and thick so as to cover the roots completely from the burning rays of the summer sun, when the rain should cease.

I showed my faith by my works; I invested all the money I had in the purchase of these lands, and all I could borrow. I induced moneyed men to join me. What I bought I sold again at a small advance to actual settlers, whom I induced to farm the land according to my notions. Men who bought of me at \$2.50 per acre, payable in one year (with privilege of another year's time, if the crop should fail) have this year harvested a crop which will very nearly ten times over pay back their purchase money. I have entered some hundreds of thousands of acres of this land. I

have sold it as fast as I could at reasonable prices to actual settlers, who have been induced by me to settle on it; others, seeing what I was doing, and having thus their attention directed to these lands, have pursued a similar course, the public mind has become excited on the subject, and settlement and cultivation have progressed in the San Joaquin Valley at a ten-fold greater rate than if there had been no "speculation" in the matter. Scores of thousands of bushels of wheat have been raised in that region this year, and hundreds of thousands will be during the coming season, over and above what would have been carried out through the Golden Gate, had no "speculator" seen the capacity of that region for wheat raising, and by circulation of documents, and by all other available means directed the attention of farmers to the land in question.

Men value little what costs them little or nothing. The air we breathe, and the water we can get for the drawing, are esteemed of little value. It is only when in the Black Hole of Calcutta, or the steerage of a steamer, that men would pray for pure air. It is only when the agent of the Spring Valley Water Company comes round for his monthly rate, that we appreciate water. Just so, as long as the land in the San Joaquin Valley could be had for the asking, nobody wanted it. When one man was seen seizing portions of it as desirable, others thought it must be, and followed suit. The result has been an unparalleled influx of farmers, an unparalleled increase of the wheat crop in that region, and better prospects still for the coming season. Under these circumstances, I think you err in charging those who have entered a few hundred thousand acres of Government land (for nine years going begging for a purchaser), with ruining the agricultural prospects of the State by holding lands at an enormous rate, and thus repelling immigration.

This land is not of the kind which invites the class of settlers who usually enter land by preemption. It is better calculated to be cultivated in larger tracts at present, than in farms of 160 acres each. It has no purling brooks, no grassy vales, no shady groves, no undulating surface. It is calculated, at present, for *making money* by raising wheat on a large scale, by men who can use six or eight mule-

team with gang-plow and seed sower. To such men it gives now better profits than any mercantile or manufacturing business in the State. When once occupied by such men, and to a certain extent exhausted for wheat raising, it will be subdivided into small farms and vineyards. The style of farming now profitable there is simply the precursor of a cultivation that will support a denser population hereafter, but which is not now pleasant or profitable in that locality. So I claim that the speculation in these lands so loudly complained of, is leading to their actual cultivation, and is a benefit to the State rather than a curse.

And I will give an illustration of the fact that the preemption laws of the United States are not calculated to induce settlement of this region—the reason being that farmers will not go upon this land to cultivate only 160 acres. Township 12 south, in range 18 east, is open to preemption settlement only, and is the best township in the neighborhood. It would sell in large tracts to farmers for actually raising wheat for \$3 per acre in coin. Yet there is not a settler upon it (although preemptors can buy 160 acres each in it for \$1.25 per acre in greenbacks), while the adjoining ownerships on the north, west, and northwest are already purchased by "speculators," and by them mostly sold out to men who are already commencing farming operations in all parts of the tract.

I do not object to being called a "speculator," if I am not charged with injury to my adopted State. It is my business to buy whatever I think I can speedily sell at an advance; to sell whatever I have so purchased, when I could get a reasonable advance; I would have been glad if those who came here "at an early day" had left vacant for me a 50 vara lot on Montgomery Street [downtown San Francisco], to be bought at United States prices under the town site laws. I would have been contented with a few of the lots on Market or other busy streets, not yet built upon or put to profitable use. But I do not denounce those as "speculators" who bought 50 vara lots at \$12.50, and still hold them, without improvements, even; still less if they have covered them with store buildings.

Nor do I think that we (I take your denunciation to myself, because I have entered more

public land than any other man in the State) are to be denounced because we buy land at the price at which it is offered us, and sell it at rates which the very first crop will many-fold repay. We procure land by lawful means, if those means ought not to be placed within our reach, why were not the laws denounced while before Congress as bills? Why not denounced after their passage, so as to secure their repeal? They have been a quarter of a century in existence; has any California paper ever denounced them . . . ?

The fact that we "speculators" have ourselves profited by these efforts of ours to induce settlement upon and cultivation of these lands, only shows that our interests and those of the State are identical; that California editors will better help the State by calling the attention of farmers to these lands and their capabilities, as well as the fact that one crop will many times repay the present price of most of them—than by broadly asserting (which certainly is not correct), that immigrant farmers are turning back from the State because they cannot find good lands subject to preemption entry.

It is undoubtedly true, that the choice lands of the State, on railroads or rivers, cannot be purchased now at \$1.25 per acre in greenbacks. Neither can lots on Montgomery Street be now bought at \$12.50 per 50 vara. In no State of the Union is fertile land, with settlers, schools and churches all about, to be bought at a dollar and a quarter per acre. He who wishes to secure the best land in any State or territory as a preemptor, must be a pioneer, set his stakes, and wait for civilization to come to him. California is no exception to this rule. It has been nearly twenty years a State; has been settled by whites I know not how many years before the gold discovery. Of course its choicest locations are no longer Government lands. Yet such is the immense area and sparse population, that any one who really desires a farm can find "ample room and verge enough," can settle as a preemptor on as good land as there is in the world, choosing from millions of acres; or he can buy land already in private hands at rates as reasonable as the Government preemption rates, considering the comparative advantage of location. . . .

S. WILLIAM S. CHAPMAN

Famous South Carolina Farmers

CLYDE E. WOODALL AND
WILLIAM H. FAVER, JR.

Rich in tradition as an agricultural colony, South Carolina has produced many pioneers in the field of agriculture. Some of these persons were statesmen and military leaders of world renown. They may not have been famous for their agricultural pursuits, but many of them were farmers with foresight and a determination to succeed in their agricultural undertakings. Others of them were instrumental in introducing new crops and systems of farming to the state and to the South.

The following short sketches of the lives and accomplishments of four such leaders are based on research done by the late Dr. William Hayne Mills, a Presbyterian Minister and subsequently Professor of Rural Sociology at Clemson College for many years. Dr. Mills is emphatic in stating that these may not be the most famous South Carolina farmers to have lived in South Carolina, but that their claim to fame is based on the real contributions which they made to the South's agriculture.

ELIZA LUCAS PINCKNEY

Experimentalist with Indigo—1722-1776

Colonel George Lucas, Governor of Antigua, West Indies, brought his family to Carolina in 1739 and settled south of Charleston on his Stono River estate.

Eliza, the daughter, was about 18 years old and had recently returned from school in England. Colonel Lucas was soon recalled to Antigua, and the management of his plantations fell upon this daughter. Eliza once stated, "I have the business of three plantations to transact, which requires much writing and more business and fatigue than you can imagine. . . . By arising very early, I find I can go through much business." For a considerable time, the "very early" was five o'clock.¹

Eliza had learned the value of indigo in Antigua and she sent for seed to experiment with its culture and manufacture in South Carolina. In the third year, after previous failures, she succeeded in making 17 pounds

of good indigo, thus reviving an industry which had been virtually abandoned. Indigo continued, for about 40 years, to be the principal agricultural product from South Carolina till after the Revolution. In 1775, 1,107,660 pounds were produced.

Eliza conducted experiments also with "Ginger, Cotton, Lucerne, and Casada." In 1741-1742, she planted "a large plantation of oaks," intending "many years hence . . . two-thirds of the produce of my oaks for a charrity."²

In the spring of 1744 she married the Honorable Charles Pinckney, who afterwards became the Chief Justice of South Carolina. But marriage and high social position did not dim her interest in agriculture. Some time later she imported silkworm eggs and began the culture of silk.

Eliza Lucas Pinckney ranks high among South Carolina's great farmers. Although her household, her books and her music were essential in her life, her interest in agriculture continued as long as she lived.

THOMAS PINCKNEY

Soldier, Patriot, Civil Engineer, Eminent Rice Planter, 1750-1828

Thomas Pinckney was the younger son of Charles and Eliza Lucas Pinckney, and was born October 23, 1750. Educated in England, he was admitted to the bar in Charleston, S. C. in 1774 to begin the practice of law. He was elected Governor of South Carolina in 1787, and after serving as Minister to Great Britain, Spain, and France, he was elected as a representative in Congress where he served two terms. In 1801 he retired from public service and for 12 years devoted his efforts to planting. But in 1812, when the second war with Great Britain began, President Madison nominated him as a junior Major-General, to have command over all the Southern half of the United States.

¹ Harriott Horry Ravenel, *Eliza Pinckney* (New York, 1896), 6.

² *Ibid.*, 38.

Pinckney was the first Vice-President of the Agricultural Society of South Carolina (organized in Charleston in 1785), and so continued for 13 years. He was the first honorary member of the Pendleton Farmers' Society (organized in 1815), of which his son and namesake, Colonel Thomas Pinckney, was the first President. He had large plantation interests on the Santee: 'Fairfield', which he gave to his eldest son, and 'Eldorado', on which he planned and built a beautiful home.

"From the windows of his stately" and typical Southern "home, General Pinckney could look upon his busy fields, and over many miles of rice-lands in the delta of the river." The daily occupation of this prosperous plantation owner consisted of "the daily inspection of his fields and rice-mills, the reports of overseers, drivers, and cattleminders," the planning "necessary to insure a wise direction of two or three hundred laborers, and to provide for twice that number of mouths." He also made daily visits to his carpenters' and blacksmiths' shops. He was greatly interested in mechanical work. Besides all this he must visit the sick of the plantation.

General Pinckney's knowledge of hydraulics and his engineering skill, acquired in the construction of fortification in Charleston Harbor, were usefully employed on the banks of the Santee.

His frequent and costly experiments contributed much to the perfection of the system which made the rice-lands of Carolina the model fields of the South, and of the world, as far as that grain is concerned. He imported a skillful engineer from Holland, who soon succeeded in protecting the land from the salt water, and thus introduced among the rice-planters of the state the Van Hassel system of embankment.³

General Pinckney at length corrected, by repeated experiments, the saline nature of the soil, and rendered it fit for the culture of rice. By constantly enlarging the cultivated area, he reclaimed a great deal of fertile land, so that from this once useless estate he sent to market annually a crop of 20,000 bushels of rice.

He collected information upon many specified topics from friends or American travelers, when friendship or favors conferred gave him the opportunity. His correspondence covered a wide range: the various soils of different countries, modes of cultivation, ro-

tation of crops, manures, implements of husbandry, everything which could be useful in the improvement of agriculture.

General Pinckney was a very successful planter and realized a large income from his property. His example stimulated his neighbors to activity and by the use of his pen he endeavored to improve the whole agricultural system of the state. Pinckney also took an active interest in the breeding of fine cattle. He brought various types of cattle from Europe and found that the Italian breeds were more suitable for working in the rice fields.

DAVID ROGERSON WILLIAMS

Progressive Experimentalist of the Pee Dee,
1776-1830

David Rogerson Williams was born March 8, 1776 near Society Hill in Darlington District. He was educated in Charleston and Providence and was elected to Congress in 1805 and 1807. When the War of 1812 began, Williams was appointed a Brigadier General. He was Governor of South Carolina from 1814 to 1817.

About 1812, at Society Hill, he erected a small yarn factory of 300 to 400 spindles which was operated for nearly 50 years. About 1819 General Williams built a boat to take cotton to Georgetown. This boat carried 300 bales of cotton, and made the trip in 15 days. It brought back all kinds of plantation supplies, thus saving the people much time and expense.

General Williams had other interests besides the manufacture of cotton. His estate included nine plantations of about 12,950 acres, but in his later years the estate on the Pee Dee was made up of only five plantations of 7,000 or more acres.

Williams was an early riser, and in the working season he inspected the work from horseback. He usually carried a gun or rifle and was accompanied by the dogs. He was first in the Southern States and one of the first in the country to use mules for agricultural purposes. He was also the first to dam the swamps of the Pee Dee against floods. He began this work about 1807 and carried it on for many years.

³C. C. Pinckney, *Life of General Thomas Pinckney* (Boston, 1895), 214-215.

In 1829, General Williams began making cottonseed oil, and experimented with it as a drying oil for painting, for lubricating, and for illuminating. Through his experiments he envisioned the time when cottonseed oil would be used in foods.

Williams found it to his advantage to rotate his crops. His essay on his agricultural methods written to the "American Farmer" in 1825 is still of great interest today.

There were 245 Negroes working on the five plantations. His introduction of mules for farm work and his various experiments were of a great and permanent benefit to South Carolina agriculture.

General Williams was killed on November 18, 1830 by a falling log while he was engaged with his carpenters in repairing a bridge over Lynch's River.

WADE HAMPTON

The Greatest Improver of Livestock, 1791-1858

Wade Hampton was the son of the first General Wade Hampton, of the Revolution, and the father of the second General Hampton, who was a Lieutenant-General of the Cavalry in the Army of Northern Virginia under General Lee, afterward Governor of South Carolina and United States Senator for many years. He was born April 21, 1791, his father's only son. His father, at death, was reported to be the wealthiest farmer in the United States. The son, known to his friends as Colonel Wade, inherited, in addition to the home plantation "Millwood," near Columbia, large plantations in Mississippi.

He spent \$60,000 in the development of Millwood, which became one of the show places of the South. It also became a meeting place for the great and the near-great, including Henry Clay, Dr. Samuel Gridley Howe, and George Bancroft.

In 1846, *The American Agriculturist* had a correspondent, R. L. Allen, traveling in the South and sending letters to the magazine. In a letter appearing in January of 1847, Allen referred to his visit to two plantations.

The first of these, belonging to Colonel Wade Hampton, is the largest, and one of the best managed estates in the South. It consists of several thousand acres of light upland, principally, sustaining a natural growth of pine and various species

of oak; and some 2,000 or 3,000 acres of very fertile bottom lands, occupying the left bank of the Congaree, near Columbia. The characteristic hospitality of its gentlemanly and intelligent proprietor demanded that my headquarters, while in the neighborhood, should be at his own mansion; and accordingly after spending a part of the day in Columbia, I found his carriage waiting to convey myself and baggage to his delightful residence about four miles distant. . . . After breakfast we mounted elegant thoroughbred saddle-horses and rode about two miles to the mansion of the late General Hampton, now unoccupied, in the vicinity of which is kept a part of Colonel Hampton's stud. This embraces numerous specimens of the best imported English horses, besides many of great merit, which he has bred himself. Colonel Hampton was a large purchaser at the sale of the late royal stud of William IV; and Monarch and King William, two of the animals bought on that occasion, possess good size, fine forms and are scarcely surpassed for reputation as breeders.⁴

During his ride over the plantation Allen saw the village in which the plantation laborers lived. He spoke also of seeing a grain mill, cotton gins, and presses driven by water power, huge barns, store rooms for grain and cotton, sheds for the various farm implements, pig barns, etc. He mentioned, too, of seeing a church for the slaves of the plantation. About four miles further they saw a sawmill. A short distance beyond these, in the bottomlands of the Congaree, were 800 acres of corn and 1600 acres of cotton cultivated in a single field. He did not fail to speak of the crops of grain, cowpeas, pumpkins, and other produce which he noticed on his inspection of the plantation.

Though expecting to find much superior stock in the hands of so spirited and intelligent an agriculturist, I was surprised to see so large a herd of purebred Durham cattle. Colonel Hampton informed me that his father procured the breed as early as 1793. . . .

Colonel Hampton has also a choice flock of long-wooled sheep, many individuals of which cannot be surpassed in the United States. These too he has bred for a long time, and finds them every way adapted to the soil and climate. . . . The mules, of which about 80 are kept on the plantation, are generally of superior merit. . . . Many of the Berkshires in Colonel Hampton's pens were fine specimens of size and form, but he is more partial to the large white pigs. . . . I regret that the limited time I had to devote to looking over Colonel Hampton's superb plantation and its choice stock, precludes my giving anything more than the above crude and brief notice of it; for weeks might

⁴ *The American Agriculturist* 6: 20 (January, 1847).

be profitably spent here in studying its details and admirable general management.⁵

Since Allen was not very friendly to the South, we may take these descriptions as accurate and the praise as well deserved.

Two years later, another Northern man, Solon Robinson, also a correspondent for the *American Agriculturist*, was a guest at Millwood. Robinson was more friendly toward the South than Allen, and he wrote

During my journey I have had great opportunities to see Negro slavery as it is, and am free to say that all the objections I ever had to the institution must give way to the strong arguments of light and reason, that, at least to the Negro, it brings a thousand blessings to one curse. I could tell you facts about the situation of the three hundred slaves upon the plantation of Colonel Wade Hampton, where

I now write this, that would go to show the condition of these people to be almost inconceivably better than that of thousands of white "free men" throughout all this region.⁶

Records of the State Agricultural Society show that Colonel Hampton was one of the principal exhibitors of horses, cattle, sheep, and hogs, and there were other premium winners who exhibited stock which originally came from Millwood. Probably no other farmer in South Carolina contributed more largely to the improvement of his domestic animals than Colonel Wade Hampton.

⁵ *Ibid.*, 21.

⁶ Kellar, Herbert A., *Solon J. Robinson, Pioneer and Agriculturist* (Fort Wayne, 1936), Vol II, 213.

AGRICULTURAL HISTORY IN HOLLAND

G. E. FUSSELL

In England the study of agricultural history is in the main a discipline that forms part of the departments of economic history in our various universities. For the past five years it has also been stimulated by the founding of the Agricultural History Society. This Society was established by private enterprise, but as it numbers amongst its members many university personnel from all over the country, and indeed foreign countries, it has intimate relations with the academic institutions where the subject is being studied.

It is of the greatest importance in Holland, where the progress of farming has been an example and a lesson to other European countries, England in particular. In 1939 a Studiekring voor de Geschiedenis van de Landbouw was privately organized as a Department of the Koninklijk Genootschap voor Landbouwwetenschap with headquarters at Wageningen. This Studiekring includes Belgian members as well as Dutch. It has published four volumes at intervals since its formation.

Enthusiasm for the subject waxed after the war, and led to the establishment of the Nederlands Agronomisch-Historisch Instituut: Instituut voor Landbouwgeschiedenis at Groningen. This Institute is financed jointly by the Dutch Ministry of Agriculture, the Farmers' Society, the Workers' Unions and the State University of Groningen. It is part of the academic world, and is now directed by Dr. L. S. Meihuizen. Its main work is the preparation of an annual international bibliography of current books, articles and original documents, under the title *Historia Agriculturae*. The fourth volume of this publication was issued early in 1958. In addition to the bibliography, records and other important sources for Dutch agricultural history are included in each volume. Besides this, the Institute undertakes the supply of information regarding sources to students and scholars both in the Netherlands and in other countries. To facilitate this work the Institute has collected a considerable and growing library of international works and prepared an extensive doc-

umentation. When agricultural archives come to its notice the Institute arranges, when possible, for them to be deposited in the State Archive Library, where they are cared for by the Keeper of State Archives.

In addition to *Historia Agriculturae* other work currently being undertaken at the Institute is (a) the collection of 16th and 17th century notices of orders issued by the local authorities for the regulation of farming and the marketing of produce; (b) a bibliography covering the life and conditions of employment of the Dutch farm worker; (c) a study of the economic history of the trade in farm produce in a polder in Zeeland in the 19th century. In addition, a hand list of sources for Dutch students of agricultural history is in preparation.

Last year the organization of agricultural history was strengthened by the establishment of a Department of Agricultural History at the Landbouwhogeschool at Wageningen under the direction of Professor B. H. Slicher van Bath, formerly Professor in the State University at Groningen. He will be responsible for a course in agricultural history for undergraduates here, and is direc-

ting research in the social and economic history of farming in Holland. In this connection he is editing a series of studies *Historische Sociografieën van het Platteland*, the first volume of which *Een Samenleving onder Spanning: Geschiedenis van het Platteland in Overijssel*, appeared last year over his own signature. He continues to act as secretary to the directing board of the Groningen Institute.

A further activity of this Department will be the reorganization of the Agricultural Museum at Wageningen on modern museum lines and its expansion to make it the repository of a collection of early agricultural equipment, implements and tools, and form an adequate instrument for the preservation and study of such things. This work is being done by Dr. J. M. G. van der Poel, formerly Director of the Groningen Institute, whose reputation is already known beyond the frontiers of Holland, and who has formulated an imposing plan for the future.

Clearly the Dutch have recognized the importance of the study of agricultural history, in the academic world, the government, and the industry itself.

CURE FOR RHEUMATISM(?)

The following is an effectual cure for the chronic rheumatism: take of full ripe Poke-berries, (they may now be had,) fill a glass bottle or vessel nearly full, pour in as much brandy as will fill the vessel, cork it for use; shake it occasionally; in two weeks, it will have extracted the juice from the berries. Take from one to three wine glasses full, in 24 hours, on an empty stomach; if too strong, a little water may be added.

—From the *Plough Boy* (1822)

THE VALUE OF PLASTER ON WHEAT

My friends—I have a farm of rising 400 acres, and some years I have sowed 100 bushels of wheat—a few years since I made an experiment—first soaked my wheat for 12 hours in water; then rolled it in plaster—in the month of April sowed one bushel of plaster on every acre; when the wheat was about 12 inches high I sowed another bushel on every acre—and when my wheat was just earing I sowed another bushel on the acre. The result was nearly 40 bushels to the acre, while my neighbor's, whose land was equal to mine, and equally well cultivated, did not average 10 bushels to the acre.

—From the *Plough Boy* (1821)

Book Reviews

Letters from a Texas Sheep Ranch, Written in 1860 and 1867 by George Wilkins Kendall to Henry Stephens Randall. Edited by HARRY JAMES BROWN. (Urbana, University of Illinois Press, 1959, viii, 156 pp., \$3.50.)

The informing and revealing correspondence here conveniently assembled will provide a major contribution to the history of sheep husbandry of the Southwest, along with important sidelights on the occupation for the country at large. The collection is another find for the vigilant prospecting of state and regional historical societies. The main body of the letters is in the Regional History Collection of Cornell University and the concluding supplemental letters in the library of the New York Historical Society.

The correspondents themselves provide another apposite example of the interest and direct involvement of leading public men of the pre-industrial period, who were trained and experienced in other professions and businesses, in cultivation and husbandry. Kendall, a native of New England, after learning his trade as a foot-loose journeyman printer in the leading cities, became a founder and editor of the popular *Picayune* at New Orleans. By the time that he ventured in large-scale sheep ranching in Texas, in the mid fifties, he had won professional and literary fame as a war and foreign correspondent and as the author of an extended personal adventure narrative of the Santa Fe trail and an elaborate military history of the Mexican War.

His congenial correspondent, Randall was no less prominent. A member of an old and distinguished family of central New York, he had a classical and legal training and a mild flare for politics. His ability as a writer was very considerable as was shown in subjects in which he had an unusual interest. As a devotee of traditional democracy, he was led to write the most detailed life of Thomas Jefferson. But more and more his interests and efforts centered on two causes, educational reform for which he wrote and served on boards, in the legislature, and as state secretary; and, what came to absorb his private

and public life, the improvement in the production and marketing of wool.

These letters written in the midst of the hurried, hectic round of seasonal labors, picture realistically the risks, hazards, and, too often, tragic disasters of frontier sheep raising: inexperience with region and climate, delays and losses in the importation of stock, disease, storms, prairie fires, predatory animals, rustlers, and Indian marauders. Kendall in changing from editorial desk to wilderness ranch, was subject to these vicissitudes but he learned quickly, not only from experience but from reading and correspondence. His methods and management soon gave him recognition as the superior sheepman of the state. In his deliberate choice of location, judicious selection of breeding stock, largely Merinos from New England, safeguards against disease, shelter from storms, provision of forage for unseasonable winters, and increasing attention to diversification, Kendall's ranching departed radically from the prevailing practices. Prudentially, he imported shepherds from Scotland and wisely relied to a marked degree upon their advice.

Kendall was ever a rational enthusiast and promoter for Texas and was impatient with faint-hearted critics. His assurance and demonstrated success brought a continuous flow of inquiries from correspondents who sought advice about migrating. Such interregional interest again demonstrates the economic bonds between North and South at a time when political relations were becoming so strained.

Secession and war brought violent interruption to the orderly course of life and economy on the ranch. Markets and currency were disrupted. Indians and lawless bands destroyed stock and murdered shepherds. Lynch law was invoked in self defense. Kendall, like his German neighbors, was a reluctant secessionist, but he was firmly devoted to the rights and interests of his state and region and supported the Confederate cause as the only safeguard against irresponsible abolitionism and centralized tyranny in the administration, as it seemed to him. Kendall, the former yankee, was a true exemplar of Southern nationalism.

Randall's conservative attitude in supporting the Breckenridge ticket kept the friends from an open break and their correspondence was renewed in 1867, a few months before Kendall's untimely death. In spite of the destructions and uncertainties of war and reconstruction, Kendall was hopeful of restoring his ranch to prosperous operation and had he lived he might again have made at least a partial recovery. He was counting much on the projected woolen mills in the region.

Dr. Brown has edited the collection with understanding competence. In addition to the voluminous writings of the correspondents, he has made effective use of government reports, Fayette Copeland's life of Kendall, the history of the *Picayune* by Thomas Dabney, and the writings of the foremost historian of sheep husbandry, Colonel Edward Wentworth. His introduction provides the needful setting and background and his annotations sedulously identify persons, places, and the numerous literary allusions of a widely-read journalist. A full and clearly organized index and contemporary end maps facilitate reference utilization.

As the first in a new series of publications in agricultural history, this book is a distinct credit to the sponsoring agencies, the Agricultural History Society and the University of Illinois Press.

Earle D. Ross
Iowa State College

The Heritage of the Middle West. Edited by JOHN J. MURRAY. (Norman, The University of Oklahoma Press, 1958, xiv, 304 pp., \$4.00.)

There is an old saying that a camel is a horse put together by a committee. When anyone is courageous enough to invite a dozen scholars to write essays describing various facets of so complex an idea as the heritage of the Middle West, he deserves genuine credit. Coe College and the Margaret Pilcher Fund are to be commended for sponsoring this project. If the final product is not a perfectly balanced study, it is, indeed, an interestingly written and provocative one.

The titles of the essays, which in some cases may appear somewhat too facile, are: "The

Inheritance from the Old World," by John J. Murray; "The Garden of the World: Fact and Fiction," by Ray A. Billington; "From Poverty to Prosperity," by Paul Sharp; "A Political Whirlpool," by John D. Hicks; "The Search for Utopia," by Arthur Bestor; "Land of the Free," by Václav L. Benes; "In Search of God," by Sidney E. Mead; "Food for Middle Western Thought," Joseph L. Blau; "A Soil for the Seeds of Literature," by John T. Flanagan; "Blazing a Trail to Higher Education," by Albert Schmidt; "What Use Art?" by Eugene Kingman; and "For Historians, a Lesson," by Walter Johnson. Needless to say, there is a good deal of overlapping. It was, of course, impossible for the authors to separate religion, education, and thought, or, for that matter, politics and economics. The result, however, is not duplication, but a differing interpretation of the same experience. This is most clearly evident in the attempts made by the various authors to define the Middle West as a region. It is obvious that there can be no agreement because the term is applied by each scholar within the context of certain characteristics of his subject matter field. Since the characteristics of politics differ from those of religion, and the same is true for the other subject areas as well, the limits of the region remain, of necessity, a matter of personal opinion.

It is interesting that the authors do tend to agree in the support of some significant generalizations, even if they do not spell out their agreement in a complete form. Most of the contributors indicate that the real nature of the region and the image of the region in the minds of the people were not in harmony. A good deal of the history of the Middle West is the story of the reconciliation of the ideal and the reality by the people. Another generalization in which the authors tend to confirm each other is in the changing connotation of the words Middle West from rural to urban. The Middle West is not continuing to represent an agricultural culture, but rather one in which industry is the determining factor. There is a touch of irony in the insistence by virtually all of the writers that the regional experiences are unique while at the same time, each insists with almost equal vigor, that what took place was a part of a nation-wide, if not world-wide experience.

There is the insistence, also, that the Middle West not only contributed to the development of the nation, but that its significance as a region is increasing rather than diminishing. This despite the admission that regionalism is a weakening concept in our world of rapid communication and mass marketing practices.

All this is indicative of the fact that *The Heritage of the Middle West* is not merely a catch-all without a central theme. It is probably true that experts in various subject matter fields will be apt to agree or disagree on aspects of particular essays, or even the twelve areas of examination, but most scholars will welcome this book.

Martin Ridge
San Diego State College

University of the Northern Plains. By LOUIS G. GEIGER. (The University of North Dakota Press, Grand Forks, N. D., 1958, 491 pp., \$5.00.)

The story that Professor Geiger tells here of the University of North Dakota is an heroic one. At Grand Forks where the University is located there was a real frontier environment in the eighties. Newspaper items of this period mentioned a free-for-all among the professionals at one of the best known "fancy" houses as to the distribution of fees, the suicide of a "frail but beautiful" private courtesan, and the conversion of a drunken half-breed into a human torch. The population of the town declined from 1,700 in 1880 to less than 200 in 1885.

In the same decade, however, there were three hundred school children already and a masonic lodge and the six churches were reported to be full. There were three high schools in the North Dakota part of Dakota Territory at Grand Forks, Fargo and Bismarck. At Grand Forks the first high school class was graduated in 1887.

Wheat had dropped to fifty cents a bushel in September of 1884 when construction on the class room building was progressing, standing like a discouraged light-house on the prairie. On the first floor was a study and classroom; on the next floor was a study and some cloakrooms. Other rooms were assigned to the President and his family on the first

and second floors. The preceptress also had a room on the first floor; the janitor had quarters in the basement for himself and his family. The janitor, the President and the preceptress, Mrs. Mott, all ate together; the President said grace. President Blackburn later complained that Mrs. Mott ate the first course while the prayer was still being intoned.

When the University opened there were as yet no furnace or storm windows for protection against the Dakota winter. The only heat was provided by three stoves in the study rooms. The water closets emptied into the "coulee," from which all available wash water was in turn drawn. Fortunately, the water closets were abandoned and outdoor toilets were substituted. Almost any residents of Dakota were accepted in the institution. Fifty per cent was the passing grade, but 40 per cent was an acceptable grade in special cases. Class work consisted mostly of recitations from textbooks. Puritanical discipline was enforced upon the students; the first morning bell was rung at 6:45; daily prayers were compulsory. The doors were closed at 9:00; lamps were to be out at 10:00. All about the only building were plowed fields and wheat, indescribably bleak and cheerless—no trees.

Much of the history of the institution is told in terms of the fortunate or unfortunate choice of presidents. Some of them were of the Chautauqua lecturer type; others were adept at manipulating political support both in the University and in the state legislature; Webster Merrifield was a scholar and an unselfish worker for the state, the institution and the students; he seems to have left a great tradition behind him. As in so many other colleges and universities, quarrels among faculty members, the academic community and the college town seem to have been normal developments.

Seminars had considerable vogue under President McVey as introduced by Professor Libby, who had been trained by Professor Frederick Jackson Turner at Wisconsin. The seminars in the social sciences seem to have been stimulated by the reform atmosphere of the late nineteenth century. Many of the books and articles produced at the University were in this field.

Student life at North Dakota was marked by many successful athletic teams, particularly the football teams coached by Walter Swetland and Gil Dobie of later Cornell fame. Soon the northern plains rang with the sound of the "Sioux" war cry:

Odz-Dzo-Dzi!
 Ri-Ri-Ri!
 Hi-yah! Hi-ya!
 North Dakota

Of almost as great interest were debate and oratory and, occasionally, baseball.

It was the particular good fortune of the University of North Dakota to be called upon to provide the higher education of a group of energetic and brilliant young men and women, mostly second-generation Norwegians, whose native genius blossomed in the soil of North Dakota when watered by the scholarship of devoted and well-trained teachers. These included Governor Lynn Frazier, Senator William Langer, Vilhjalmur Stefanson, explorer and author, Maxwell Anderson, outstanding American playwright, William Lemke, leader of the Non-Partisan League and United States Senator, Thomas Campbell, the "world's greatest wheat grower," and Elmer Ellis, American historian and later president of the University of Missouri.

Geiger notes that a number of these were occasionally subject to University discipline: both Lemke and Frazier were expelled from their dormitory. Geiger isn't sure that Stefanson's honors and fame before the "great world" made up for all the trouble he caused when he was an undergraduate. There still is some confusion in official circles as to whether Stef was expelled or simply suspended. But he remembers that the expulsion was announced before all faculty and students at a chapel meeting, which sounds official enough to satisfy almost anybody. He is a tradition among undergraduates at the University of North Dakota: the man who broke all of the rules of the institution and "more or less" got away with it.

One does not always get as lively books as this to review.

Robert Samuel Fletcher
 Oberlin College

Perspectives on Conservation: Essays on America's Natural Resources. Edited by HENRY JARRETT. (Baltimore, The Johns Hopkins Press, 1958, xii, 260 pp., \$5.00.)

"Conservationists are unquestionably useful people." So says John Kenneth Galbraith in his essay—one of 23 in this volume. The reader will agree. These various papers owe their origin to Resources for the Future, an organization which sponsored a series of programs early in 1958 at the Cosmos Club, Washington, D. C. The occasion was the fiftieth anniversary of the Governors' Conference at the White House and the one hundredth anniversary of Theodore Roosevelt's birth. But, the editor remarks, this is not a commemorative volume in the usual sense. It is an attempt to examine the record of the past 50 years but also to make a contribution "to the understanding and solution of present resource problems and those of the next fifty years."

The book is divided into six sections stemming from the six programs, each with a main paper, followed by supplementary or critical papers. The first section, a good historical coverage, is entitled: "The First Fifty Years." The remaining sections are more or less specialized, as the titles indicate: "Science, Technology, and Natural Resources"; "Resource Demands and Living Standards"; "Urban Growth and Natural Resources"; "Some Determinants of Resource Policy"; "Organizing for Conservation and Development." For the reader interested in conservation today and its multifarious aspects and implications, the book has especial value.

It is of course impossible in a short review to give due credit to the many contributors. However, the first section on historical background was of particular interest to this reviewer. Ernest S. Griffith in his lengthy appraisal of "Main Lines of Thought and Action," the first 50 years, gives a relatively orthodox interpretation: The great leadership of Theodore Roosevelt and Gifford Pinchot; the cautiousness of William Howard Taft; Woodrow Wilson's preoccupation with other matters than natural resources; 1920 as an important year for conservation, with its water power and minerals leasing legislation; the "conservation explosion" in Franklin Roosevelt's first term; and the many continuing problems at mid-century, closely re-

lated to those of 1908. "The emphases have changed," he says, "but in most essential elements 1958 is but 1908 illuminated." Samuel P. Hays, in his short paper, "The Mythology of Conservation," takes exception vigorously to the above interpretation. Conservation, he asserts, has "radically altered its course" in the last fifty years, "shifting from an open, optimistic, hopeful movement, tied to a broad philosophy of human improvement, to a more rigid, pessimistic one, deeply affected by a fear for human survival." Thomas B. Nolan, Director of the Geological Survey, later enters this argument. He believes that the original conservationists were as a matter of fact fearful that resources would be exhausted; and he concludes that in the years since 1908 the "Inexhaustible Resource of Technology" has brought about a reassuring picture, in so far as physical resources alone are concerned.

Galbraith has written a disturbingly uncomplacent article entitled, "How Much Should a Country Consume?" The national "appetite," he believes, should be curbed if conservation is to have much meaning. This leads to an endless chain of problems such as the heavy, wasteful American automobile and the "institution" of planned obsolescence. Can nothing be done about it? The first step, says Galbraith, is to shed our reluctance to discuss the subject. After all, "freedom is not much concerned with tail fins or even with automobiles."

The above illustrations, it is hoped, will adequately suggest the interesting ideas in this volume. It is well worth reading.

J. Leonard Bates
University of Illinois

Land: The Yearbook of Agriculture, 1958.

By the United States Department of Agriculture. (Washington, D. C., Government Printing Office, 1958, xi, 605 pp., \$2.25.)

Historians who value the 1940 Yearbook should find the 1958 volume equally appealing and useful. Numerous members of the Agricultural History Society contributed to the work, including Dr. Charles L. Stewart, about whom the editor wrote: "If it were our policy to dedicate a Yearbook of Agriculture to an individual, this Yearbook would

be dedicated to Charles L. Stewart, professor of agricultural economics in the University of Illinois, for his active interest in this book and this subject and for his devoted, conspicuously successful teaching of others to appreciate its scope and importance." Dr. Stewart, who is retiring this year from his long career as a teacher, served on the Yearbook Committee and co-authored articles in the section on "Some Financial Aspects of Land Use." The Yearbook is a fitting tribute to our friend and colleague, Charles L. Stewart.

The entire Yearbook is of the highest quality. Two sections of pictures are included, the first of which has particular merit as history. Entitled "Forever the Land," it offers a pictorial "account of what the fathers found; the winning of the West; the growth of people and the Nation; the development of scientific agriculture; problems of this later day; what of the future?" The second section of pictures consists entirely of aerial photographs of "The Face of Our Land"—from Aroostook County, Maine, to Santa Clara County, California. Fourteen pages of highly useful charts and maps, many of which are historical, are unfortunately buried near the center of the book without adequate notice in the Table of Contents. They are important enough to warrant a special mention in the front matter of the Yearbook.

The articles in the book are too numerous to mention; however, the ten major sections will indicate the basic approach to a study of the "Land." These topics are (1) Our Heritage of Land, (2) How We Use and Manage Public Lands, (3) How We Use Our Private Lands, (4) Some Financial Aspects of Land Use, (5) Rights, Ownership, and Tenure, (6) Taking Care of What We Have, (7) Our Woods and Temple Hills, (8) These Also Are Our Country [articles on Alaska, Hawaii and Puerto Rico], (9) Our Growing Needs and Problems, and (10) Planning for a Better Use.

This brief listing of major parts of the Yearbook can only suggest the varied subjects covered. Every person interested in agricultural history will discover a wealth of material on most topics. No better book bargain exists.

C. Clyde Jones
University of Illinois

Economic Development in the Southern Piedmont 1860-1950, Its Impact on Agriculture. By ANTHONY M. TANG. (Chapel Hill, The University of North Carolina Press, 1958, xv, 256 pp., \$6.00.)

This monograph, the first of a contemplated series, is the outcome of a research project begun some six years ago by three Vanderbilt University economists. Their concern is the long-standing problem of rural poverty, with emphasis on local and regional disparity in farm income and productivity. Each researcher has undertaken a systematic investigation of a typical Southern rural area, Professor Tang's study embracing 21 counties in the South Carolina-Georgia Piedmont region. The aim is to put various popular diagnoses as to cause, and the often controversial remedies prescribed, to a searching analysis in the hope of eliminating irrelevant or mistaken theories and opinion and finding at least a few genuinely sound conclusions based on empirical evidence.

In pursuit of this objective, Professor Tang has applied exhaustive empirical tests to a hypothesis, originally advanced by Professor Theodore W. Schultz of the University of Chicago, to the effect that the long-term, increasing geographical disparity in farm income is explained by the pattern of local industrial-urban development. The historical evidence is conclusive. In the preindustrial era the output of farm labor and the level of farm income was about the same in every region. Industrial-urban growth, whenever and wherever it occurred, disturbed the former equilibrium. Over the years the regional gap in farm income has widened, and at present, despite several decades of uninterrupted prosperity, is as serious as ever.

The process by which farm income levels are affected is examined in much detail. Seldom has the reviewer witnessed such thorough and foolproof analysis or such ingenuity in overcoming limitations of data and other hurdles to objective analysis. Every hypothesis is lucidly stated. Testing procedures are carefully formulated and skillfully applied. Terms are precisely defined, e.g., who should be classified as a "farm worker," and what constitutes "net income" from agricultural activities?

Rural areas which came under the influence of a nearby industrial-urban matrix benefited materially from more efficient market organization and resource allocation. Farmers received better prices, and had substantially more money in the bank. Surplus farm labor found alternative employment opportunities, while the remaining farmers invested more money in equipment and livestock and in general were able to better their condition. "The relatively strong positive income effect exerted by industrial-urban development upon local agriculture was largely the result of the ability of such development to absorb formerly underemployed farm labor" (p. 219). Yet, heavy out-migration from the underdeveloped counties has not succeeded in raising the returns to agricultural labor to a level comparable with that of the developed counties. This finding is a bothersome one, and leads to the conclusion that maintenance of full-employment as a solution to poverty in agriculture would seem to require supplementary remedial action on the part of the government. Technological advance should free agricultural resources for general economic development rather than add to total farm output, maintains Professor Tang. The burden of such resource transfer should be a governmental responsibility for, left on their own, low-income farm areas in the United States are in a situation not unlike that of "a man pursuing a receding horizon" (p. 224).

Professor Tang has performed a truly valuable service in demolishing and discarding, or minimizing, the confusion of forces and factors commonly advanced to explain regional income differentials in agriculture. For example, Southern farmers hunt and fish as much as they do, not because they prefer a lazy way of life but because extra labor applied to their land would probably not yield returns worth the effort; moreover, if alternative opportunities for making money were at hand they might even give up hunting and fishing altogether. The findings of this study support this view, and indicate also that the percent of farm population of the Negro race has no appreciable effect on farm income. Neither are the crop-lien system of extending credit and the practice of sharecropping a

plausible explanation for the relative poverty of Southern agriculture. The author is convinced that these make-shift arrangements were forced on the South by historical circumstances and would long since have been outgrown if the general pattern of economic de-

velopment had not lagged far behind that of such metropolitan areas as Chicago, which undoubtedly exerts a strong positive income effect on Illinois and Iowa agriculture.

Frederick W. Kohlmeyer
University of Illinois

Book Briefs

Water Witching U. S. A. By EVON Z. VOGT and RAY HYMAN. (Chicago, University of Chicago Press, 1959, xii, 248 pp., \$4.95.)

In the preface the authors reveal that they got together and wrote the book because of their interest in water witching from the standpoint of their respective disciplines, anthropology and psychology. Another interest of the authors is in magic, and a large part of the book deals with the manner in which psychological conditioning brought forth unexplained or "magical" reactions to water witching, table rocking, educated horses, and other related questions.

This reviewer accepts the advice of the authors, and will not attempt to become an expert in fields in which he has no training. The chapters dealing with why and how witching works are interesting reading to the novice. Whether the conclusions reached are valid is primarily in the field of psychology.

The historian will find a general history of water witching in chapter 2. The historian interested in agriculture in a particular part of the country will find a few tables of a generalized nature dealing with the amount of water witching practiced in his area—he will also find it difficult to refer to them as there is no index. The use of the book in an historical approach to a specific subject such as the part water witching played in Brown county, Nebraska, is almost non-existent.

It is a pleasant and instructive book for one wanting to learn something about water witching as a general subject. The last chapter, "Water Witching as Magical Divination" does a good job of stating the reason for and

the place of water witching in our present society.

W. D. Aeschbacher
Nebraska State Historical Society

International Resources and National Policy.

By OLIN T. MOUZON. (New York, Harper & Brothers, 1959, xiv, 752 pp., \$7.50.)

A book on international resources, because of its enormous scope, offers a great challenge to an author. Professor Mouzon, who wrote this particular book over a four-year period, not only met the challenge effectively but added the concept of national policy *vis-à-vis* these resources. Written for use as a textbook or as a guide to policy-makers, the book is crammed full of statistical data which makes it a useful reference volume for persons interested in international affairs.

The author clearly defines his personal choice of American policy objectives—the promoting of maximum freedom and security for the peoples of the world. He recognizes the basic incompatibility of maximum economic security on the one hand and maximum individual and national freedoms on the other. Within this limitation, he argues that in the strength of the free world lies the future hopes of the United States to achieve the twin goals of security and freedom. Our policies must foster the four primary elements—economic, military, political and moral-psychological—of this strength. These four elements are called our *national resources*; we must make the most strategic use of them to attain maximum freedom, security, strength, and economic progress on an international scale.

Agricultural historians will find the nearly 200 pages devoted to agricultural resources, international trade in agricultural commodities, and American farm policy highly useful, especially in respect to the statistical data presented in tabular and geographical form. Professor Mouzon analyzes the world's agricultural resources and production, drawing largely on publications of the U.S.D.A. Office of Foreign Agricultural Relations and the United Nations' Food and Agriculture Organization. His minute breakdown of international trade on a commodity-by-commodity basis is particularly excellent. The material on agricultural policy largely relates American farm policy to international trade problems. In this respect, Mouzon defines the fundamental agricultural problem as that of inadequate food supplies for more than one half of the world's people.

The remaining five hundred pages of the book consider other resources under the heading of "material and energy" resources, capital resources and human resources. The subject of "Strategy of Security," built around a consideration of geopolitics and economics (geoeconomics), concludes the study.

C. Clyde Jones
University of Illinois

Preliminary Inventory of the Records of the Bureau of Agricultural Economics. By VIVIAN WISER. (The National Archives, National Archives and Records Service, General Services Administration, Washington, 1958, 212 pp.)

This publication is one of a long series of "preliminary" or provisional inventories of the National Archives. The establishment and organization of the Bureau of Agricultural Economics is traced briefly in the introduction. The inventory itself consists of four basic parts: (1) general records which apply to the operations of the Bureau as a whole; (2) divisional records; (3) state offices' records; and (4) regional offices' records. Eight appendices include lists relating to general correspondence of the Bureau, lists of project files, lists relating to records of the Division

of Land Economics, lists relating to the Division of Statistical and Historical Research, and a select bibliography of references on the Bureau.

National Archives Accessions. Issued as a Supplement 54 to the *National Archives Guide*. (Washington, D. C., Exhibits and Publication Branch, General Services Administration, National Archives and Records Service, 1958, 48 pp.)

Meyer H. Fishbein presents a brief historical account of early business statistical operations by the Federal Government as an introduction to this list of accessions for the year July 1, 1956 to June 30, 1957. Naturally, much of the nineteenth century activity was directed toward agricultural data. Of particular interest to agricultural historians are the acquisition by the National Archives of Records from the following: Office of the Secretary of Agriculture; Civilian Conservation Corps; Bureau of Land Management; Bureau of Plant Industry, Soils, and Agricultural Engineering; Bureau of Agricultural Economics; Farmers Home Administration; Bureau of Reclamation; Tennessee Valley Authority; Commodity Exchange Authority; Indian Claims Commission and the Office of Geography.

Buffalo Bill and the Wild West. By HENRY BLACKMAN SELL and VICTOR WEYBRIGHT. A Signet Key Book. (New York, The New American Library, 1959, x, 320 pp., \$.50.)

The New American Library series has made available in paperback form a book published by Oxford University Press in 1955. The book is a profusely illustrated biography which follows William F. Cody's career from boyhood in Iowa and Kansas to the closing performances of his great Wild West Show. It is based on authoritative sources and is well written. The romance and drama of the American West are preserved in this colorful account of the "last of the great frontier scouts."

Notes and Comments

APRIL 1959 MEETING

The Agricultural History Society, meeting with the Mississippi Valley Historical Association in Denver, Colorado, held a joint session with the Association as well as its annual business meeting on April 23, 1959, and a luncheon on April 24, 1959.

The joint session of the Society and the Mississippi Valley Historical Association, arranged by Harry J. Brown of Michigan State University, convened at 2:30 p.m., April 23, 1959. C. Clyde Jones of the University of Illinois served as chairman. In the first paper, entitled "Social Theory and the Frontiers," Allan G. Bogue of the State University of Iowa suggested that the social structure of pioneer communities influenced the personality of the pioneer. Mr. Bogue reviewed Turner's social theory and the concepts and theories of a number of sociologists and anthropologists, and related ideas to the pioneer period of the Middlewestern prairie. He concluded that the absence of an established social framework on the frontier may have fundamentally affected the development of economic and social organization in the Midwest.

Clayton Ellsworth of Wooster College, in his discussion of "Theodore Roosevelt's Country Life Commission," pointed out that the Commission was the result of almost four years of planning by Roosevelt, Sir Horace Plunkett, Gifford Pinchott, and Liberty Hyde Bailey. The Commission's *Report* was ignored by Roosevelt's successors in the presidency. However, over a period of time, the history of a better rural America has been the history of the acceptance of the Commission's recommendations.

The third paper, "The American Impressions of a French Botanist, 1873," was presented by Dwight W. Morrow, Jr., of Lincoln University. Mr. Morrow discussed the American travels of Jules Emile Planchon, from the University of Montpellier in southern France, who visited this country in 1873 to identify and procure phyloxera-resistant American grapevines for the disease-ridden vineyards of southern France. He received help from Charles V. Riley, one of America's

leading entomologists. Generally, Planchon believed that most aspects of American civilization compared unfavorably with those of France.

At the conclusion of an animated discussion of the papers, the annual business meeting was called to order by President Vernon Carstensen. A motion was seconded and passed to dispense with reading the minutes of the previous meeting. The Secretary-Treasurer read his financial report, pointing out that since expenditures exceeded receipts by over eight hundred dollars in 1958, it was necessary to cut the size of the journal. Mr. Rasmussen reported that the Society had 34 more paid members and subscribers in 1958 than in 1957, and 184 more than in 1951.

C. Clyde Jones, editor, reported that he had a number of excellent articles at hand for publication, but would welcome additional contributions. He urged those present to encourage their graduate students to submit manuscripts for consideration for publication and for the Edwards Memorial Award. Mr. Jones stated that the economic necessity of holding the journal to a limited number of pages was causing a delay in the publication of articles. George Anderson moved that the Society express its appreciation to C. Clyde Jones for the excellent work that he was doing for the journal. The motion was seconded and passed unanimously. Mr. Anderson then moved that the Society express its appreciation to Wayne D. Rasmussen for his work as secretary-treasurer. The motion was seconded and passed unanimously.

The report of the Nominating Committee was presented by George Anderson, chairman. In a close election, in which 129 members cast ballots, the following officers were elected: president, H. C. M. Case; vice president, Weymouth T. Jordan; secretary-treasurer, Wayne D. Rasmussen; executive committee, Robert G. Dunbar and James H. Shideler; and book award committee, D. A. Brown.

Mr. Rasmussen moved that the Society express its gratitude to Fred Shannon for his service for three years as chairman of the Edwards Memorial Awards Committee. The

motion was seconded and passed unanimously. The motion was made that the Society thank the Mississippi Valley Historical Association, particularly its secretary-treasurer, William D. Aeschbacher, and its program committee, for the most satisfactory arrangements made for the joint session and luncheon sponsored by the Society. Several members expressed their appreciation of the arrangements, after which the motion was seconded and passed.

Mr. Shannon announced on behalf of the Edwards Memorial Award Committee that no student award was being made for 1958 since no manuscripts had been submitted, and that the award for the best published article in *Agricultural History* had been made to Gene M. Gressley for his article, "The Turner Thesis—A Problem in Historiography." The Book Award Committee announced that the prize manuscript for 1959 was "God Speed the Plow," by Clark C. Spence. There being no further business, the meeting was adjourned.

The Society's luncheon was held on Friday, April 24, 1959, and was well attended by members of the Society and the Association. Lewis E. Atherton introduced Vernon Carstensen, president of the Society, who addressed the group on "The Genesis of an Agricultural Experiment Station." Mr. Carstensen stated that in many ways the agricultural experiment stations, established during the 1870's and 1880's, represented the first step taken to bring science to the service of our society in an organized way at public expense. The experiment stations not only were to have a profound influence upon agriculture but they also provided an example which was to help shape the pattern of industrial and other publicly supported research agencies.

The Wisconsin Agricultural Experiment Station was opened officially on October 1, 1883. This, like those in other states, represented the culmination of a long period of groping for a way in which the farmer could be aided in improving his methods and becoming more productive.

In 1866, the Wisconsin legislature decided to assign the lands given the state under the Morrill Land Grant College Act of 1862 to the University, with the responsibility for cre-

ating a college of agriculture and mechanic arts. The agricultural department grew slowly. Farm groups urged that it be given a practical turn. Many leaders believed that experimentation would provide practical answers to many farm problems, so the idea of an experiment station was welcomed. The usefulness of scientific research and experimentation was soon proven, for in 1890 Stephen M. Babcock announced the invention of a simple, accurate test for the butter fat content of milk.

Upon the conclusion of Mr. Carstensen's paper, a brief discussion was held, and Mr. Atherton then declared the meeting adjourned.

FINANCIAL STATEMENT

January 1, 1958 to December 31, 1958

Agricultural History Society

Amount in checking account,
January 1, 1958 \$2,164.91

Amount in savings fund, Interstate
Bldg. Assn., January 1, 1958 2,378.42

Receipts to December 31, 1958:

Sale of reprints	\$ 4.25
Sale of back numbers ..	571.15
1957 dues	30.00
1958 dues	2,218.00
1959 dues	1,573.00
1960-1961 dues	55.00
Contributions through Illinois Development Fund	111.25
Edwards Memorial Fund contributions ..	80.00
Microfilm royalty	1.12
Life member- ship payments	15.00
Contributions	150.00
Interest	90.45

Total Receipts \$4,899.22

Total to be accounted for \$9,442.55

Expenditures to December 31, 1958:

Garrard Press, printing four issues of journal	\$4,907.25
Office stationary	76.50
Postage	151.50
Office expenses, ICA project	10.50

Office expenses, editorial	106.50
Refunds on subscriptions	6.00
Bond for Secretary-Treasurer	10.00
Edwards Memorial Awards	100.00
Returned checks	16.35
Joint dues to Economic History Association	189.00
Payment for back numbers	48.38
Joint meeting expenses	12.00
Total Expenditure	\$5,633.98
Amount in checking account, December 31, 1958	\$1,339.70*
Amount in savings fund, Interstate Bldg. Assn., December 31, 1958	\$2,468.87
Total accounted for	\$9,442.55

*Of this total, \$187.37 comprises the Edwards Memorial Fund.

EDWARD NORRIS WENTWORTH

1887-1959

Edward N. Wentworth, president of the Agricultural History Society from 1952 to 1954, and long active in the affairs of the Society, died April 21.

A livestock specialist, his energetic pursuit of wide-ranging interests brought him distinction in other fields as well. Trained in animal husbandry, chiefly at the Iowa State College of Agriculture and Mechanical Arts, his early career was in teaching at the Iowa college and Kansas State Agricultural College, and in writing in the field of animal husbandry. He served as a Captain in the Field Artillery in World War I, and as military director of the College of Agriculture of the AEF University, at Beaune, France. In 1919 he joined the staff of Armour and Co., Chicago, in the public relations department and was director of Armour's Livestock Bureau from 1923 until his retirement in 1954.

A distinguished writer, he was author or co-author of *America's Sheep Trails; History, Personalities* (1948); *Cattle and Men* (1955); *Pigs from Cave to Corn Belt* (1950); and *Shepherd's Empire* (1945). Many of his arti-

cles were published in widely differing periodicals, as: Iowa Academy of Science *Proceedings*; U. S. Department of Agriculture *Journal of Agricultural Research*; *Westerners Brand Book*; *Cattleman*; *American Sheep and Goat Raiser*; *Mississippi Valley Historical Review*; and *Agricultural History*. His article on "Dried Meat—Early Man's Travel Ration," published in *Agricultural History*, was republished in the *Annual Report* for 1956 of the Smithsonian Institution, and, slightly changed, in *Armour's Analysis*.

FRONTIER REPRINTS

A list of articles which have appeared in *Agricultural History* on the frontier, frontier theory, and Frederick Jackson Turner, 1927-1958, is available upon request to Wayne D. Rasmussen, Secretary-Treasurer, Agricultural History Society, U. S. Agricultural Marketing Service, Washington 25, D. C. The list indicates articles for which reprints are available.

CONTRIBUTORS AND NEW MEMBERS

The Society gratefully acknowledges contributions by Donald Jackson, Murray Kane, and Marjorie L. Warner. Gilbert C. Fite, Mary G. Lacy, and Ruth Nordin have recently become life members of the Society. Contributing members for 1959 include Clayton S. Ellsworth, Wheeler McMillen, and Alexander Nunn. New members for 1959 include: Fred W. Beier, Jr., Hardy C. Berry, Edward C. Blackorby, Jerome Blum, Robert E. Burke, Donald F. Carmony, John A. Carroll, Ira J. Condit, David E. Conrad, Robert R. Dykstra, Arval L. Erikson, John D. Farr, H. L. Garrigus, Louis G. Geiger, David Herlihy, Val Kuska, James S. Lane, Grace H. Larsen, Franklin L. McCarthy, Neil A. McNall, Gilman M. Ostrander, William N. Parker, Robert L. Partin, Owen Pollock, Howard D. Roepke, William W. Rogers, Harry N. Scheiber, Sister Thomas More, L. G. Sorden, John A. Stevenson, Harold B. Vroman, H. A. Wallace, Robert W. Williams, and Elisabeth Woodburn.

NORTH DAKOTA SOCIAL SCIENCE ASSOCIATION

The North Dakota Social Science Association (college teachers of history and the social sciences) held its organizational meeting at Bismarck, April 3-4, 1959. The following officers were elected: Louis G. Geiger, University of North Dakota, president; Vernon Hektner, State School of Science, vice-president; Arlow Anderson, Jamestown College, secretary-treasurer; Courtney Cleland, North Dakota Agricultural College, member-at-large of the executive board.

At the first session, a dinner on April 3, Edward C. Blackorby, State Teachers College, Dickinson, read a paper on "William Lemke and the Union Party." On Saturday morning following a breakfast and business meeting, Elwyn B. Robinson, University of North Dakota, presented a paper on "Themes of North Dakota History."

About fifty people, representing every college in the state, attended the meeting. The next meeting will be on October 9-10, 1959, at Jamestown College. At the opening session Professor William B. Hesseltine, University of Wisconsin, will speak on "Abraham Lincoln: Architect of a Nation." The session on Saturday morning will be devoted to a symposium on the general subject of the college professors' responsibility for the history and social science curriculum in North Dakota high schools.

TRUMAN PAPERS

On May 11, 1959, the Harry S. Truman Library Institute for National and International Affairs opened to researchers a significant

portion of the Truman Presidential Papers at the Harry S. Truman Library, Independence, Missouri. Individuals interested in working in these papers should make advance application to Dr. Philip C. Brooks, Director of the Library. The Institute has established a system of grants-in-aid to provide travel and living expenses for a limited number of persons using the Truman Papers. Further information about these grants is available from Dr. Brooks.

The Smithsonian Institution would like to acquire a number of farm implements. These items include a shovel plow, preferably with wooden beam and stock, either single or double; a prairie breaking plow; an "A" frame wooden harrow with wood or iron teeth; a horse-drawn check row corn planter; a wheeled cultivator; a simple "ground hog" thresher; a one-horse thresher with straw separator; a wide hoe with eye instead of tang, like old cotton choppers; a narrow hoe-like grub hoe or mattock with eye for handle; riddles or sieves for separating grain; a horse-drawn hay rake (fixed type); and a sweep horse power for four or more horses. Communicate directly with Mr. Edward C. Kendall, Associate Curator of Agriculture, Smithsonian Institution, Washington 25, D. C.

The response of members to the book review questionnaire was extremely gratifying. We still need the names of persons qualified to review books on Far Eastern history and books written in German and Dutch languages. The editor will welcome suggestions in this regard.

Recent Articles of Interest

Compiled by GERTRUDE A. SLICHTER

Agricultural History Review—Volume VII, Part 1, 1959: "The Animal Remains found at Kirkstall Abbey," by M. L. Ryder; "Some Agricultural History Salvaged," by H. Cecil Pawson; "The Tithe Surveys of the Mid-Nineteenth Century," by H. C. Prince; "Plough Rituals in England and Scotland," by Thomas Davidson.

Annals of Iowa—April, 1959: "Development of the Grange in Iowa, 1868-1930," by Myrtle Beinhauer.

Chronicles of Oklahoma—Winter, 1958-1959: "The First Panhandle Land Grant," by Raymond Estep.

The Geographical Review—January, 1959:

"Milk Production in England and Wales. A study in the Influence of Collective Marketing," by E. S. Simpson.

Geography—January, 1959: "Some Reflections on Agricultural Geography," by R. Ogilvie Buchanan; "England's Diminished Hop-Acreage," by D. C. D. Pocock.

Idaho Yesterdays—Summer, 1958: "Farmers Forgotten; Nez Perce Suppliers of the North Idaho Gold Rush Days," by Donald N. Wells.

Journal of World History—IV—4, 1958: "Ancient Egypt, A Centre of Agriculture," by D. G. Reder.

Maryland Historical Magazine—March, 1959: "Freight Rates in the Maryland Tobacco Trade, 1705-1762," by John M. Hemphill, II.

Michigan History—March, 1959: "The Mich-

igan Land Rush in 1836," ed. by Douglas H. Gordon and George S. May.

Minnesota History—March, 1959: "Lumber and Labor in the Lake States," by George B. Engberg; "Ignatius Donnelly, Minnesota Congressman, 1863-69," by Martin Ridge.

Pacific Northwest Quarterly—January 1959: "Geographic Setting for the Recent History of the Inland Empire (Part II)," Herman J. Deutsch.

Pennsylvania Magazine—April, 1959: "Germans and Agriculture in Colonial Pennsylvania," by John G. Gagliardo.

Vermont Life—Spring, 1959: "Sheep in Vermont," by Miriam Chapin.

Virginia Magazine—April, 1959: "Cattle in Seventeenth Century Virginia," by Wesley N. Laing.

Activities of Members

Bushrod W. Allin, U. S. Agricultural Marketing Service, addressed the 1958 convention of the Association of Southern Agricultural Workers on "The Farm Problem: Economics vs. Justice."

Robert G. Dunbar, Montana State College, read a paper at the Denver meetings of the MVHA on early irrigation in Colorado.

Phil R. Jack discussed "Thoughts on the Study of History and Folklore," in *Pennsylvania History*, October 1958.

Donald L. Kenimerer is spending the summer in Afghanistan. He is a member of a team of University of Illinois professors who will advise the University of Kabul on courses and curricula.

Frederic C. Lane discussed "Economic Consequences of Organized Violence," in *Journal of Economic History*, 18:401-417 (December 1958).

Raymond J. Penn of the University of Wisconsin participated in an economic planning seminar in Caracas, Venezuela, on November 17-27, 1958, in connection with the twentieth anniversary of the Economics Faculty of the University of Caracas.

James H. Shideler, University of California at Davis, read a paper at the Denver meetings of the MVHA on "Hoover, Wilson and Food Control, 1917-1918." Professor Shideler also has received a grant from the Social Science Research Council to

travel to various locations in the United States to finish research on a book-length study of agricultural affairs during the period of World War I.

Charles W. Turner of Washington and Lee University discussed "The Franklin Society, 1800-1891," in the *Virginia Magazine of History and Biography*, October 1958.

Carl R. Woodward, long active in the Society, has become President Emeritus of the University of Rhode Island.

Elisabeth Woodburn, Booknoll Farm, Hopewell, New Jersey, has published an attractive catalogue of gardening books from the sixteenth to twentieth centuries.

The U. S. Department of Agriculture has named H. M. Briggs and Wheeler McMillen members of its Distinguished Service Award Committee.

The following papers presented by members of the Society at the 1958 meeting of the American Farm Economic Association appear in the *Journal of Farm Economics* for December 1958: "Scientific Progress in Adjustments," A. W. Epp (co-author); "Social Security for Farm Operators: Acceptance and Role in Farm Population Adjustment," by J. C. Ellickson; "Tenure Innovation and Tenure Problems Associated with Vertical Integration," by R. J. Penn; and "Agricultural Statistics in a Changing World," by O. V. Wells.

The Authors

G. E. FUSSELL, formerly with the British Ministry of Agriculture, Fisheries, and Food, is now devoting full time to historical research and writing.

A. M. GIBSON is Head of Manuscripts Division and Phillips Collection, University Library, and Assistant Professor of History, University of Oklahoma.

EUGENE LERNER is Assistant Professor of Finance at the City College of New York. He has written several articles on inflation in the Confederacy during the Civil War and has contributed to *Studies in the Quantity Theory of Money*, edited by Milton Friedman.

G. D. NASH is Visiting Assistant Professor of History at Stanford University.

HOWARD G. ROEPKE is Assistant Professor of Economic Geography at the University of Illinois. He is engaged in continuing research on the identification and analysis of areas of rapid agricultural change in both the United States and Europe.

CLARK C. SPENCE is Assistant Professor of History at Pennsylvania State University and author of *British Investments and the American Mining Frontier, 1860-1901*.

CLYDE E. WOODALL and W. H. FAVER, JR. are Assistant Agricultural Economists with the South Carolina Agricultural Experiment Station, Clemson College, Clemson, South Carolina.

CURIOUS FISH

In some rivers in Guiane, there is a curious fish, about the size of a smelt, which has four eyes, two on each side placed one above the other; it is remarkable that when swimming, it keeps two eyes above, and the other two below the surface.

—From the *Plough Boy* (1821)

FROGS

Fresh frogs from the Calumet are daily served up in all our principal Chicago eating houses. We have never tried them, but judging from the noise they make in their native habitat, they must be grand fellows—quite up to the French standard and worthy of the palate of an epicure.

From *Journal of Agriculture* (1858)

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- On Agricultural Policy: A Symposium.....M. R. Benedict, G. E. Brandow,
D. E. Hathaway, R. J. Penn, and T. W. Schultz
- Four Economists in the Political Process.....Richard S. Kirkendall
- Towards an International Dimension in Agricultural Economics.....Lawrence Witt
- A Generalization of the Working Method for Estimating
Long-run Elasticities.....George W. Ladd and John R. Tedford
- Proceedings Papers of the Winter Meeting with the Joint Allied Social Science Associations,
December 27-29, Chicago

This Journal contains additional articles, notes, book reviews, and announcement of new bulletins in agricultural economics and is published in February, May, August, November and December. Yearly subscription is \$9.00.

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The American Economic Association, founded in 1885, is an organization with membership of over seven thousand persons interested in the study of economics or the economic phases of social and political questions. Its purpose is the encouragement of perfect freedom of economic discussion. The Association as such takes no partisan attitude, nor will it commit its members to any position on practical economic questions.

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The Everett Eugene Edwards Awards
in Agricultural History

The Agricultural History Society, in partial recognition of the outstanding services of Everett E. Edwards to the organization and in honor of his memory, has established the Everett Eugene Edwards Memorial Awards to be given to the authors of the two best articles (presidential addresses excluded) in *Agricultural History* each year. One prize of \$50.00 is offered for the best manuscript submitted by an author who is in the course of taking a degree and one prize of \$50.00 for the best published article by an author who is a more advanced scholar.

The Awards are financed from the Edwards Memorial Fund to which all members of the Society and other interested persons are invited to subscribe. However, the amounts necessary to pay the Awards for a period of ten years have been guaranteed by three of Edwards' former co-workers.

All articles to be considered for publication and other communications regarding editorial matters should be addressed to C. CLYDE JONES, 214 David Kinley Hall, University of Illinois, Urbana, Illinois. Address inquiries regarding the MEMORIAL FUND, MEMBERSHIP IN THE SOCIETY, and business matters to WAYNE D. RASMUSSEN, *Secretary-Treasurer*, U. S. Agricultural Marketing Service, Washington 25, D. C.